

103 REVIEW THE STATUS OF PLANNING FOR THE 2000  
CENSUS

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Y4.P84/10:  
103-24

HEARING  
BEFORE THE  
SUBCOMMITTEE ON CENSUS, STATISTICS AND  
POSTAL PERSONNEL  
OF THE  
COMMITTEE ON  
POST OFFICE AND CIVIL SERVICE  
HOUSE OF REPRESENTATIVES  
ONE HUNDRED THIRD CONGRESS

FIRST SESSION

OCTOBER 7, 1993

**Serial No. 103-24**

Printed for the use of the Committee on Post Office and Civil Service



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# REVIEW THE STATUS OF PLANNING FOR THE 2000 CENSUS

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THURSDAY, OCTOBER 7, 1993

HOUSE OF REPRESENTATIVES,  
SUBCOMMITTEE ON CENSUS, STATISTICS AND POSTAL  
PERSONNEL,  
COMMITTEE ON POST OFFICE AND, CIVIL SERVICE,  
*Washington, DC.*

The subcommittee met, pursuant to call, at 1:26 p.m., in room 311, Cannon House Office Building, Hon. Thomas C. Sawyer (chairman of the subcommittee) presiding.

Members present: Representatives Sawyer and Petri.

Mr. SAWYER. Good afternoon. I really am grateful for everybody's flexibility. First of all, having to change the hearing from this morning until this afternoon, and now being as late as I am. I can only apologize and offer my thanks.

If this hearing were not so important and timely, I don't suppose I would be quite as concerned about it. The Bureau's progress toward a census design, particularly the test for the next census, is so important, particularly inasmuch as we are operating against difficult deadlines for the 1995 test. It will clearly define what we can and can't do in 2000.

I have looked at the Bureau's proposed design. I really want to compliment everybody who has worked so hard to bring it to the condition that it is in since just last May. It has clearly been a real effort. I remember at the time GAO was concerned about whether or not it would be possible to proceed with the kind of fundamental reform that we have been talking about for some time.

The Bureau has focused its work on several proposals. They are the notion of a single best count or one number census, the use of targeted methods, including statistical sampling, to collect information about people who don't get back to us through the mail, and the development of means to conduct more frequent, accurate information gathering throughout the decade.

I think the Bureau is on the right track. But clearly we have got to do several things in the meantime. We have got to demonstrate to the data user community, both in and out of Government, that the new methods address concerns of accuracy, cost, and precision.

We have got to demonstrate that the benefits outweigh what will clearly be the costs of wherever we head in terms of a continuous measurement system. And the Bureau has got to continue to be able to show they can cover a lot of ground in a fairly short period of time. We are in the process of not necessarily making that any

easier, given that we may not have as much in terms of absolute resources as the Bureau may need in order to do the work that it has laid out for itself.

Let me go over each of these points. First, I think it is important to recognize that the way in which we are able to generate the trust and cooperation from the appropriators is the continuing ability to demonstrate that proposals can reduce the undercount and can contain costs. There is wide consensus on those goals, but less agreement on how we are going to get there.

I really believe that all of us, but the Bureau is probably in a better position than anybody to regain the kind of confidence that it has earned, but may not enjoy, must explain to Congress and more importantly to the Nation how the kind of scientific methods that are within our grasp today can lead to measurably more accurate results. That is an enormous challenge.

People are skeptical of things they don't understand, and the truth is that any technical or even technological advances that we may make will be in vain if we don't enjoy public confidence.

Second, the continuing reliance on the census for the full range of information that we may want or desire, may not be possible. The Bureau's work toward a data collection system that collects timely information throughout the decade has been encouraging. And so have the reactions to it.

The real question is whether the advantages outweigh the costs. Congress will want to know so we can choose whether or not to pay for those advantages.

Clearly, in summary, what we save in more timely data in terms of the quality of the decisionmaking that follows from more frequent data, will be important in determining cost and benefit. We have got to justify the kind of more permanent workforce that distributing that work load throughout the decade will require. Those kinds of answers aren't easy to put into numbers, but they are important.

Finally, there really is no replacement for a vigorous pace as we go into 1995. Time is extremely limited. A lot of people are concerned about the details of how the reforms would actually work. If we are left with inconclusive test results, we will be left without the kind of information to evaluate everything that the Bureau has accomplished. I don't want that to happen.

I know that the Bureau intends to provide the needed details in the near future. I really hope we can continue to focus our efforts in places where we can make demonstrable improvements and real gains for the year 2000.

Finally, let me just mention one thing very specifically. It has come to my attention that some special interests have questioned the authority and completeness of the National Academy of Science's work with regard to a number of things, including legal issues surrounding the census. I just want to reiterate my confidence in the Academy's objectivity and thoroughness. If anyone has grounds for concern about their legal conclusions, I would encourage them to come forward with specific evidence.

We have with us today Harry A. Scarr, Acting Director of the Census Bureau; Nye Stevens, who is the Director of Planning and Reporting for the General Government Division of GAO; and Dr.



Norman Bradburn, who is the Chair of the panel to evaluate alternative census methods, the National Academy of Sciences.

It is good to have you all here, and I thank you for your presence. If we just treat this entire set of witnesses as a single panel, I think we will save a lot of time and we can promote more in the way of real conversation.

Dr. Scarr.

**STATEMENTS OF HARRY A. SCARR, ACTING DIRECTOR, BUREAU OF THE CENSUS; L. NYE STEVENS, DIRECTOR, PLANNING AND REPORTING, GENERAL GOVERNMENT DIVISION, U.S. GENERAL ACCOUNTING OFFICE; AND NORMAN BRADBURN, CHAIR, PANEL TO EVALUATE ALTERNATIVE CENSUS METHODS, COMMITTEE ON NATIONAL STATISTICS, NATIONAL ACADEMY OF SCIENCES**

Mr. SCARR. Thank you, Mr. Chairman. If it is all right, I will make my formal testimony for the record and then make a few remarks abstracted from it.

Mr. SAWYER. It will be included verbatim, without objection.

Mr. SCARR. Thank you, sir. It is a pleasure to be here to testify on the status of designing and planning the 2000 decennial census.

The key result of our work since May 27 is this: The next census will be fundamentally changed from past censuses. We are on schedule in managing the process of testing, choosing and implementing those changes.

Mr. Chairman, I would like to note that the 10-year cycle for the 1990 census ended 1 week ago today. In the, quote, old days, unquote, we would just now be starting the cycle for the next census. Instead, we have had a formal research and development process in place for almost 3 years, and actually began long-range planning 5 years ago.

This approach to planning, involving an initial design phase, is itself a fundamental change from past censuses. The shift in strategy resulted from a common conclusion reached by the Bureau, the Department of Commerce, this committee and other committees in Congress, the GAO, and OMB, that it was time for a review of both the core methods and overall scope of the decennial census.

When the task force for designing the year 2000 census and census-related activities was announced in November 1990, the concept of, quote, reinventing government, unquote, was not widely known, and the recently completed National Performance Review was nearly 3 years away. Yet, in a September 7, 1993 letter to the President, transmitting the rules of that review, Vice President Gore's opening paragraph stated an overall goal, quote, to create a Government that works better and costs less, unquote. Our task force has had a parallel goal of making fundamental reforms in the decennial census.

Design choices. The goal of the 1995 census test is to provide information to determine if the fundamental changes being considered for the 2000 census show promise in containing costs and improving accuracy. Design choices were made by selecting the most promising building blocks from the many ideas we solicited and studied over the past 3 years. In turn, we have issued test design

recommendations to further document these best ideas and the fundamental changes they imply.

For the 1995 tests, we will first work with the U.S. Postal Service to update the master address file; second, use a questionnaire that is respondent-rather-than-machine friendly; third, offer respondents more ways and more opportunities to respond to the census than have been offered in the past; four, contact only a sample of nonrespondents and use statistical estimation methods to account for the rest; five, make greater use of the Postal Service to identify vacant and nonexistent housing units; six, produce a single set of results, combining counting and estimation by legal deadlines, rather than producing estimates of precision after legal deadlines; seven, collect only those data specifically required by statute during the census, and, on a parallel track, separate from the 1995 test, develop a system to spread the collection of other data throughout the decade.

Let me spend a few minutes on what I believe is the most fundamental change of all, the use of sampling and statistical estimation in lieu of protracted and costly efforts to directly enumerate those who do not mail back a census form. This change, if it proves workable and the Bureau proceeds with it, represents an historic departure from 200 years of census taking in this country.

As you know, the Bureau considered statistical adjustment of the census after both the 1980 and 1990 censuses. The decision in each case was not to statistically adjust the enumeration results. Many of the arguments in the debate surrounding those decisions are still apt, particularly the issue of precision of small area estimates.

But we now believe that some version of such a fundamental change is required, because we believe we have gone as far as we can using traditional counting methods to make the count complete. Even though each of the last two censuses counted between 98 and 99 percent of the population, this overall level of accuracy left unacceptably high differential undercounts between demographic groups.

Any use of sampling and statistical estimation as a part of census taking will increase uncertainties of estimates at finer geographic levels and will decrease uncertainties of estimates at the national, state, and other large geographic levels.

We are conducting research on technical ways to measure the uncertainty and minimize it, but whether it is acceptable to introduce new sources of uncertainty into the census, sources that will affect areas differentially, but in unknown ways, is a policy issue that must be addressed. What we do know is that there is little potential for reducing the differential undercount further and containing costs using traditional counting methods.

Status of our research activities. Mr. Chairman, let me now describe progress in our research activities since I last testified.

We issued final criteria against which to assess census designs in the Federal Register on July 20. The most significant change we made in those criteria was to move reducing differential undercounts from the list of desirable criteria to the list of mandatory criteria. This was in response to many recommendations that we do so.

We have completed the mail and telephone mode test and issued final findings from those studies.

This summer, we conducted the appeals and long form experiment to see if a respondent-friendly questionnaire and multiple contacts can improve response rate for longer census forms.

We held an interagency conference on administrative records in Washington, DC. The conference provided valuable information for continued planning for using administrative records in the 1995 test and in the 2000 census.

We completed an assessment of home-based technologies such as telephone, cable television, and personal computers for possible use as response options in 2000. We contracted for the development of a prototype pen-based computer system to use in an address list and map updating. We have engaged the National Institute of Standards and Technology to arrange a second Bureau-sponsored conference on optical character recognition.

We have completed planning for a test of the effectiveness of mailing Spanish language questionnaires to targeted areas. We sponsored a conference on research issues for improving coverage of the homeless population to participate in the discussion of methodologies we are considering for 2000.

Status of research on sampling and estimation. We continue our research on various uses of sampling and estimation. While we have decided to conduct nonresponse follow-up on a sample basis in the 1995 tests, we still must decide whether to visit a sample of housing units from each block or visit every housing unit in a sample of blocks. We also must decide at what stage of follow-up to begin sampling.

We have also been studying the notion of truncating follow-up activities. We recently conducted intensive design workshops to examine two new methodologies we are considering for measuring and improving coverage in a one number census.

The SuperCensus and CensusPlus. We held design workshops to determine what changes we could make to the census process that would allow time to use the post-enumeration survey approach and still produce a one number census by statutory deadlines.

Cooperative efforts with the U.S. Postal Service. Since I last testified, all work with the Postal Service has progressed along several fronts. We have been working with staff from the Postal Service to enhance and make better use of their services to take the census. The expertise of the letter carriers and address list development, which I will discuss momentarily, and in the identification of vacant and nonexistent houses—a critical way that the Postal Service can assist in the census.

We plan to test this concept in the 1995 test. We have worked with the Postal Service to study to what extent letter carriers could actually conduct the nonresponse follow-up. Together, we are documenting the results of our investigation in a report that will be available shortly. We have been working with the Postal Service on a pilot test using Postal Service address information to update and correct selected 1990 census address files.

The Census Bureau and the Postal Service continue to cooperate successfully in other areas that make use of our joint expertise on geographic issues. That includes sharing of information to identify

mail deliveries for each district of the 103d Congress, lending assistance to the Postal Service effort to match each ZIP plus four code with a 1990 census block number, providing to the Postal Service a specially formatted extract of the tiger database for several areas in which the Postal Service will test automated carrier route restructuring this fall, exploring with the Postal Service ways to encourage rural areas to convert from rural route to street number addressing systems.

Mr. Chairman, we can now focus on completing research needed to support the 1995 test design. The most serious threat to our preparations for the 1995 test is the possibility of a major cut in our fiscal year 1994 budget request.

While we would carry out our test even at the figure recommended by the House Appropriations subcommittee report of June 24, 1993, we cannot complete all the research I have described at that figure. At that level, the only changes we can test in 1995 will be those relating to respondent friendly questionnaire design, cooperative efforts with the U.S. Postal Service and State and local governments to build and maintain an accurate address file, having the Postal Service identify vacant and nonexistent units, sampling for nonresponse follow-up, and the use of integrated coverage measurement to provide for a one number census by combining counting and estimation results by legal deadlines.

Mr. Chairman, let me now discuss our analysis of Federal data needs and alternative sources of such data. In December 1992, the OMB formally requested that all Federal agencies document their data needs for the 2000 census. Recently, we have concentrated on identifying those data needs required by statute. This focus results from report language accompanying the fiscal year 1994 appropriations bill passed by the House Appropriations Subcommittee.

That report states:

The committee encourages the Office of Management and Budget to take the lead in working with other Federal data users to determine the most appropriate and cost-effective alternative means of data collection, and to ensure that only the data needed to satisfy statutory requirements is being collected at taxpayer expense.

We have been working with the OMB to implement this guidance. This represents a change from our earlier plans for the 1995 tests. As we described in the test design alternative recommendations, and as I testified in May, our plan had been to use the same 100 percent and sample topics which we used in the 1990 census in the 1995 tests.

Finally, we have continued our research on alternative sources of data to meet the needs of Federal agencies and other data users. We have made considerable progress in the development of a continuous measurement system prototype. The prototype provides a chance for each of us to better understand the opportunities of such an approach.

Mr. Chairman, that concludes my testimony. Let me summarize by repeating that we are on schedule to test fundamental change for the 2000 census, we have a great deal of work ahead of us. The task we have set for ourselves to reinvent the census is an audacious one. We are quite aware of how difficult it will be to complete it. I believe we are where we should be at this time.

I will be happy to answer questions.

[The prepared statement of Mr. Scarr follows:]

PREPARED STATEMENT OF HARRY A. SCARR, ACTING DIRECTOR, BUREAU OF THE CENSUS

INTRODUCTION

Mr. Chairman, it is a pleasure to be here today to testify on the status of designing and planning the 2000 decennial census. We have completed many activities since I last testified on May 27, so there is much to cover. The key result of our work is this: The next census will be fundamentally changed from past censuses, and we are on schedule in managing the process of testing, choosing, and implementing those changes.

Mr. Chairman, I note that the ten-year cycle for the 1990 census ended one week ago today. In the "old days," we would just now be starting the cycle for the next census. Instead, we have had a formal research and development process in place for almost three years, and actually began long-range planning five years ago. This approach to planning, involving an initial design phase, is itself a fundamental change from past censuses.

This shift in strategy resulted from a common conclusion reached by the Census Bureau, the Department of Commerce, this Committee and others in Congress, the General Accounting Office, and the Office of Management and Budget (OMB) that it was time for a fundamental review of both the core methods and overall scope of the decennial census. When the Task Force for Designing the Year 2000 Census and Census-Related Activities for 2000-2009 was announced in November 1990, the concept of "reinventing government" was not widely known, and the recently completed National Performance Review was nearly three years away.

Yet, in his September 7, 1993, letter to the President transmitting the results of that review, Vice President Gore's opening paragraph stated an overall goal—"to create a government that works better and costs less." Our Task Force has had a parallel goal of making fundamental reforms in the decennial census.

The Vice President also described how ideas and advice were solicited from all across America to gain both the insights and the involvement of all those with a stake in the outcome. This too parallels our Task Force commitment to an open process—open to all ideas and to all stakeholders in the census design.

The Task Force and the National Performance Review are alike in other ways:

- Both efforts are only a beginning. New visions are a necessary first step towards successful change. To quote Yogi Berra: "If you don't know where you're going, you'll probably wind up someplace else!" But a good roadmap is not enough to get from where we are to where we want to be—we still have to get in the car and go.
- Both efforts are difficult. In many ways, redesigning the census has been much harder than taking the census. It is not easy to question the core methods and beliefs that have guided the Census Bureau for decades. It is not easy for our customers and stakeholders either, even those who recognize that changes are needed. Once again, Mr. Berra said it best: "The trouble with changing things is that once you're done, things are different!"
- Finally, both efforts recognize that sound public policy is more than doing things right—we also have to do the right things. The 1990 census is a case in point. From an operational perspective, it was the best census we have ever taken. But many consider it a failure because a \$2.6 billion effort was unable to eliminate differential undercounts. The decennial census yearbook captured many good snapshots of America, but it left out too many portraits of the "Class of 1990." We must do better.

Mr. Chairman, before I respond to the specific questions you raised in your letter of invitation, I want to summarize the design choices for the 1995 Census Test.

DESIGN CHOICES FOR THE 1995 CENSUS TEST

We are just over halfway through our effort to design a better census. As you know, the final design choices for the 2000 census will be made by the end of 1995. Many of those choices will depend on findings from the census tests we are planning for that year. The goal of the 1995 Census Test is to provide information to determine if the fundamental changes being considered for the 2000 census show promise in containing costs and improving accuracy.

Our goal for the Fall of 1993 was to make virtually all of the final decisions necessary to proceed to plan the design of the 1995 tests, and we have done that. In August, our Year 2000 Research and Development Staff released the 1995 Census

Test Design Recommendations for review. Although we still were receiving and reviewing comments as this testimony was being prepared, the comments to date are gratifyingly supportive of the recommended design changes for the 1995 Census Test.

Mr. Chairman, I earlier stated that the next census will be fundamentally different from past censuses. The design of the 1995 Census Test embodies these changes, which were described in the Test Design Recommendations and which are summarized in Figure 1 attached to my testimony.

These design choices were made by selecting the most promising building blocks from the many ideas we solicited and studied over the past three years. When we issued 14 Design Alternative Recommendations on May 17, 1993, we documented the best features of the designs and combined those features into a design for a new and fundamentally different census in the year 2000.

In turn, we issued Test Design Recommendations to further document these "best" ideas and the fundamental changes they imply. I described most of these when I testified here last May, so I will only briefly touch upon them today. For the 1995 tests we will:

1. Work with the U.S. Postal Service to update the Master Address File (based on the 1990 census address list) rather than compile a test census address list from scratch. As I will describe later, we are actively working with the Postal Service on other joint ventures.

2. Use a questionnaire that is respondent-friendly, rather than one that is machine-friendly.

3. Offer respondents more ways and more opportunities to respond to the census than have been offered in prior censuses.

4. Contact only a sample of nonrespondents and use statistical estimation methods to account for the rest, rather than making numerous, costly attempts to count every household.

5. Make greater use of the Postal Service to identify vacant and nonexistent housing units.

6. Produce a single set of results combining counting and estimation by legal deadlines rather than produce estimates of precision after legal deadlines.

7. Collect only those data specifically required by statute during the census and, on a parallel track—separate from the 1995 Census Test—develop a system to spread the collection of other data throughout the decade.

I want to spend a few minutes on what I believe is the most fundamental change of all—the use of sampling and statistical estimation in lieu of protracted and costly efforts to directly enumerate those who do not mail back a census form, or those who otherwise would be missed by traditional counting methods.

This change, if it proves workable and the Bureau proceeds with it, represents a historic departure from 200 years of census-taking in this country. As you know, the Bureau considered a statistical adjustment of the census after both the 1980 and 1990 censuses. The decision in each case was not to statistically adjust the enumeration results. Many of the arguments in the debate surrounding those decisions are still apt—particularly the issue of precision of small area estimates. But we now believe that some version of such a fundamental change is required because we believe we have gone as far as we can using traditional counting methods to make the count complete. Even though each of the last two censuses counted between 98 and 99 percent of the population, this overall level of accuracy left unacceptably high differential undercounts between demographic groups.

For the 2000 census, we are considering using statistical estimation to produce a "one-number census." As I explained earlier, that would mean producing a single set of results combining counting and estimation by statutory deadlines rather than producing estimates of error after those deadlines and having two competing sets of numbers.

Mr. Chairman, I know that you and others have endorsed this concept of a "one-number census"; that is, producing only one set of official census numbers based on a combination of counting and statistical techniques. More recently, the National Academy of Sciences endorsed this concept in an interim report from the National Research Council's Committee on National Statistics. The report was prepared by the Committee's Panel to Evaluate Alternative Census Methods, chaired by Dr. Norman Bradburn who will be testifying about the report later today.

We are confident that the use of statistical estimation holds great promise for reducing costs. Vice President Gore's National Performance Review noted this fact in proposing that the Census Bureau conduct nonresponse follow-up on a sample basis.

Statistical estimation offers promise for reducing known coverage errors, but it also introduces a new uncertainty that has both technical and policy dimensions. A

moment ago, I mentioned that small-area accuracy still is an issue even with a "one-number" design. I want to expand on this point.

Use of statistical techniques does two things:

1. It allows us to account for people who will not be picked up using counting procedures.

2. It introduces new uncertainty into the census results.

Any use of sampling and statistical estimation as a part of census-taking will increase uncertainties of estimates at finer geographic levels and will decrease uncertainties of estimates at the national, state, and other large geographic levels. We have gone as far as possible in reducing the differential undercount using traditional census methodology. The trade-off is to use statistical estimation to reduce differential undercount for larger areas which will have the unavoidable consequence of introducing additional uncertainty about the count at finer geographic levels.

We are conducting research on technical ways to measure the uncertainty and minimize it. But whether it is acceptable to introduce new sources of uncertainty into the census (sources that will affect areas differentially, but in unknown ways) is a policy issue that must be addressed. What we do know is that there is little potential for reducing the differential undercount and containing costs using traditional counting methods alone.

As I have noted in previous hearings before this Subcommittee, it is my personal belief that we may need to seek legislation to allow us to use sampling in arriving at the counts at all levels of geography.

#### STATUS OF RESEARCH ACTIVITIES

Mr. Chairman, let me turn now to progress in our research activities since I last testified.

In addition to preparing and discussing the Design Alternative Recommendations and the Test Design Recommendations, we also completed several key tests, research projects, and conferences; made final plans for some additional tests and conferences; are developing a joint document with the U.S. Postal Service detailing how their role in address listing efforts and data collection might be expanded to assist us in the census; completed our preliminary analysis of Federal data needs; and outlined a prototype "continuous measurement" system that may serve as an alternative, and perhaps better, way to meet many data needs for the next decade.

We issued final criteria against which to assess census designs in the Federal Register on July 20. Along with the final criteria, we summarized the comments we had received and any changes we made in the criteria based on those comments. The most significant change was to move "reducing differential undercounts" from the list of desirable criteria to the list of mandatory criteria. This was in response to many recommendations that we do so.

We completed the Mail and Telephone Mode Test and issued final findings. Of all the households that responded in the test, eight percent preferred to respond by telephone rather than by mail. However, those with a preference for telephone will also respond by mail, so there was no significant increase in the overall response rate due to offering telephone as a response mode. This indicates that we should offer the telephone option as a convenience to respondents and as a possible way to speed data collection, but not in hopes of increasing overall response rates.

This summer, we conducted the Appeals and Long-Form Experiment to see if a respondent-friendly questionnaire and multiple contacts can improve response rates for long forms. We had demonstrated earlier that it did so for shorter forms. The test also was designed to measure whether emphasizing the mandatory nature of the census is more effective than emphasizing the benefits of answering and the confidentiality of the data.

Final results will be issued this month, but preliminary findings are very encouraging. These preliminary results suggest that 1) we obtained much higher response rates for long forms than we have heretofore seen in census tests, and that 2) groups of individuals in panels that emphasized mandatory response had significantly higher response rates. The latter result parallels similar findings from the economic censuses we conducted this year. We believe these findings mean that we are on the right track in our efforts to maximize response rates. We will emphasize friendly design, multiple contacts, and mandatory response in the 1995 Census Test questionnaires.

On July 15, we held an Interagency Conference on Administrative Records here in Washington, D.C. The purpose of the conference was to address barriers to statistical uses of Federal administrative records. Perhaps the key issues are the lack of a uniform policy across agencies on these matters and access to the records by the Census Bureau. The conference provided valuable information for continued plan-

ning for using administrative records in the 1995 Census Test and in the 2000 census. We are preparing proceedings from the conference to document the discussions.

We completed an assessment of home-based technologies—such as telephone, cable television, and personal computers—for possible use as response options in 2000. The results of the assessment suggest that voice recognition and touch-tone data entry—in both cases coupled with voice recording—are the most promising technologies that we should focus on as additional primary response options for the 2000 census.

We have contracted for the development of a prototype pen-based computer system to use in address list and map updating. We have also engaged the National Institute of Standards and Technology to arrange a second Bureau-sponsored conference on optical character recognition.

We have completed planning for a test of the effectiveness of mailing Spanish language questionnaires to targeted areas. Findings from the 1990 census suggested to us that language difficulties were a significant barrier to census participation by Hispanics. The purposes of the test are to 1) determine if making these forms available at the time of mailout will increase response rates; 2) assess the reactions of respondents, both Hispanics and non-Hispanics, to receiving these forms; and 3) determine if this approach also reduces nonresponse rates for each question.

On September 28–29, we sponsored a conference on “Research Issues for Improving Coverage of the Homeless Population.” We invited representatives of national homeless coalitions, researchers, and data users to participate in a discussion of methodologies we are considering for 2000.

Planning continues on residence rules and roster research. We believe, based on our research, that one source of coverage error results from misunderstandings by respondents about whom to include as a member of a census “household.” Misunderstandings also occur when rules used for determining residence do not correspond to the ways in which people live. These “living situations” are the subject of a survey we are currently conducting. We will supplement this survey with cognitive research designed to gain a better understanding of the ways in which respondents think about such concepts as household membership and usual residence. Finally, we will conduct a mailout test next January to study two new approaches to residency and roster issues: One is designed to reduce misunderstandings about whom to report as usual residents at an address. The other is designed to list all persons with any connection to an address and then to collect alternative addresses for each.

#### STATUS OF RESEARCH ON SAMPLING AND ESTIMATION

Mr. Chairman, we continue our research on various uses of sampling and estimation. This also has been a major focus of Dr. Bradburn’s panel, and I commend their recent report for an excellent summary of the issues.

We now are reviewing that panel’s recommendations, along with our own findings, as a further step toward making final choices about sample designs and methods that need to be tested in 1995.

For example, while we have decided to conduct nonresponse followup on a sample basis in the 1995 tests, we still must decide whether to visit a sample of housing units from each block or visit every housing unit in a sample of blocks. We also must decide at what stage of follow-up to begin sampling. If our technical findings and cost modeling do not lead to a definitive choice, we will test more than one approach in 1995 to gain additional insights.

We also have been studying the notion of “truncating” the follow-up activities. We would start conducting follow-up activities as we have in the past by trying to visit every nonresponding housing unit; then, at some point in the operation we would cut it short and then account for the remaining households via estimation. Dr. Bradburn’s panel has suggested an interesting approach that would combine truncation with sampling for nonresponse. That is, to conduct nonresponse follow-up on a 100-percent basis until a certain date; truncate the operation at that point; then conduct follow-up for a sample of the remaining workload.

This summer we conducted intensive design workshops to examine two new methodologies we are considering for measuring and improving coverage in a “one-number census” approach. One of these is the SuperCensus in which we would conduct the enumeration in a sample of blocks using special methods too expensive to be used everywhere. The special methods might include using administrative records, participant observers, and highly trained interviewers. We would develop estimates for areas where we did not use special methods using modeling and estimation techniques. The other method is CensusPlus, which also would involve using special enumeration procedures in a sample of census blocks and modeling and esti-



mation. The major difference between the two methods is that while SuperCensus would occur simultaneously with a regular enumeration, CensusPlus would take place after the completion of a regular enumeration.

We also held design workshops to determine what changes we could make to the census process that would allow time to use the Post Enumeration Survey approach and still produce a "one-number" census by statutory deadlines. Again, Dr. Bradburn's panel has provided both an excellent summary of the ideas and issues involved here and several valuable recommendations about how to determine which approach or approaches warrant inclusion in the 1995 Census Test. Though we soon must choose a methodology for use in the "one-number census" approach, we must continue research to further our knowledge of estimation techniques and total error structures. We recently arranged for advice and assistance from several experts in these fields.

#### STATUS OF COOPERATIVE EFFORTS WITH U.S. POSTAL SERVICE

Since I last testified, our work with the Postal Service has progressed along several fronts.

We have been working with staff from the Postal Service to enhance and to make better use of their services to take the census. The expertise of the letter carriers in address list development (which I will discuss momentarily) and in the identification of vacant and nonexistent housing is a critical way that the Postal Service can assist in the census. The interagency Joint Committee for Census Planning met again on July 30, 1993. The focus of this meeting was to begin developing plans for using letter carriers to identify vacant and nonexistent housing units. We plan to test this concept in the 1995 test.

We also worked with the Postal Service to study to what extent letter carriers could actually conduct the nonresponse follow-up. Together we are documenting the results of our discussions and investigation in a report that I will make available to you shortly. While the knowledge of local letter carriers would be a benefit in conducting nonresponse follow-up, there are obstacles to the implementation of this idea. Among these are the impact on the delivery of the mail, conflicts that arise with laws and Postal Service regulations regarding privacy of information about postal customers, and the cost of using postal workers to collect data. We are jointly aggressively exploring the most useful ways for enhanced Postal Service involvement in census-taking.

How let me turn to Postal Service involvement in address list development. We have been working with the Postal Service on a pilot test using Postal Service address information to update and correct selected 1990 census address files. Together we selected areas containing about 900,000 addresses for the pilot project. In order to protect the confidentiality of census data, we swore in Postal Service staff who have access to the census address list.

The two agencies need to analyze the results of this pilot test to determine the details of a fully cooperative effort to continually update the census address list. In addition, the two agencies are actively looking at what, if any, statutory changes will be required for each to make efficient use of the address information it has.

In late June 1993, the Postal Service received the census addresses for the study areas, and preliminary results from the match of the address lists became available for analysis at the end of July 1993. To aid in our analysis, the Postal Service is providing information about all individual addresses in the pilot areas and has done so consistent with its legal requirements to protect the confidentiality of data.

Also as part of the pilot study, we will provide maps to the Postal Service on which their staff will sketch the location of the streets not in the Census Bureau's file. This will help us determine the location of streets that are missing from our geographic files. Using this information, we will add the new streets to our TIGER data base. The Census Bureau began delivery of these maps within the past week.

The Census Bureau and the Postal Service continue to cooperate successfully in other areas that make use of our joint expertise on geographic issues. These include:

- We are engaged in the sharing of information to identify mail deliveries for each district of the 103rd Congress.
- We are lending assistance to the Postal Service effort to match each ZIP+4 Code with a 1990 census block number.
- We will be providing to the Postal Service a specially formatted extract of the TIGER data base (with enhancements added specifically to meet Postal Service requirements) for several areas in which the Postal Service will test automated carrier route restructuring this fall.
- We are exploring with the Postal Service ways to encourage rural areas to convert from rural-route to street-number addressing systems.

## TASKS TO BE COMPLETED BEFORE THE 1995 CENSUS TEST

Mr. Chairman, now that we have made Test Design decisions we can begin the detailed operational planning and preparation for that test. There is a great deal to do in the near future, but I am confident we will successfully carry out those tasks. We can now focus on completing research needed to support the 1995 test design.

The remaining work on nonresponse sampling methods is one example. Others include the residence rules and roster test planned for January; the Spanish language questionnaire mailout test; ongoing efforts to find the best ways to use Administrative Records for targeting special methods or as part of our coverage measurement system; final choices about the use of telephones and other home-based technologies as alternative response modes; decisions about the best use of pen-based computers, optical character recognition, and other emerging data capture technologies; continued consultations with the OMB and others on the appropriate wording for race and ethnicity questions; development of alternative enumeration techniques most likely to overcome the major barriers to complete coverage that we have identified; and ongoing efforts to use cost modeling to help ensure that cost containment is considered in all our choices. We have begun to identify sites that will maximize our ability to learn how well these new methodologies work.

At the moment, the most serious threat to our preparations for the 1995 test is the possibility of a major cut in our FY 1994 budget request. While we will carry out a test even at the figure recommended by the House Appropriations Subcommittee report of June 24, 1993, we cannot complete all of the research I have described if that mark holds. We would have to eliminate testing of many of the promising building blocks for fundamental change. These would include plans to examine special methods targeted at known undercount problems, planned research on new technologies to make it easier for people to respond to the census or for processing the data, the use of administrative records to improve accuracy, and consultations with stakeholders. At that \$8.1 million level, the only changes we can test in 1995 will be those relating to respondent friendly questionnaire design, cooperative efforts with the U.S. Postal Service and state and local governments to build and maintain an accurate address file, having the Postal Service identify vacant and nonexistent units, sampling for nonresponse follow-up, and the use of integrated coverage measurement to provide for a "one-number census" by combining counting and estimation results by legal deadlines.

## ANALYSIS OF DATA NEEDS AND ALTERNATIVE SOURCES

Mr. Chairman, I now will discuss our analysis of Federal data needs and alternative sources of such data.

As you know, in December 1992 the OMB formally requested that all Federal agencies document their data needs for the 2000 census. All responses have been received and we have been working with the OMB to review and interpret the implications of these needs for the 2000 census design.

Recently we have concentrated on identifying those data needs required by statute. This focus results from report language accompanying the FY 1994 appropriations bill passed by the House Appropriations Subcommittee. That report states:

The Committee encourages the Office of Management and Budget to take the lead in working with other Federal data users to determine the most appropriate and cost-effective alternative means of data collection, and to ensure that only the data needed to satisfy statutory requirements is being collected at taxpayer expense.

We have been working with the OMB to implement this guidance, and have prepared a preliminary analysis of the topics that, in our judgment based on consultation with counsel and affected agencies, appear to be required by statute to be collected from the census. We will continue to review this analysis with the OMB, with the other agencies, with legal counsel, and with staff from this Subcommittee and the Appropriations Subcommittee. At this point, we now plan to use in the 1995 Census Test only the following topics that will be asked on a 100-percent basis: population count, relationships within the unit, race, ethnicity, age, sex, and ownership status of the housing unit. We plan to include the following topics on a sample basis: education, place of birth, citizenship, year of entry, language, income, number of rooms, the year the structure was built, and farm residence.

This represents a change from our earlier plans for the 1995 tests. As described in the Test Design Alternative Recommendations, and as I testified in May, our plan had been to use the same 100-percent and sample topics as we used in the 1990 census. This would have allowed maximum flexibility in examining various other operational questions and their interaction with both the short and long forms.

The 1995 Census Test was never intended to be a formal part of the content determination process. In fact, as I stated in May, decisions on content can and should be made at the end of 1995 as part of the final choice of the 2000 census design. This should be the result of a distinct, but parallel, coordinative effort. However, we are responding to congressional guidance on content for the 1995 Census Test, guidance which suggests the procedures and content I have just described.

Finally, we have continued our research on alternative sources of data to meet the needs of Federal agencies and other data users. In particular I want to describe progress in the development of a "continuous measurement system" prototype. I know you are very interested in this concept, Mr. Chairman. It probably comes closest to your vision of fundamental change whereby much of the data now collected once a decade would be collected instead as part of an ongoing survey effort throughout the decade. Besides reducing the complexity and cost of the decennial effort, such an approach would produce estimates more often—a real improvement in meeting the ever-growing data needs of this nation.

We have made progress over the last several months in developing a detailed prototype of such a system. In fact, we have greatly accelerated our timetable and have produced this prototype much earlier than we originally thought possible. We are in the midst of presenting and discussing this prototype with the various committees of the Task Force, with organizations such as the American Statistical Association and the Population Association of America, with the OMB, with staff from this Committee and others in the Congress, and with other data users. Data users are particularly interested in how data from continuous measurement will meet their needs and in the types of products that will be available.

The prototype provides a chance for each of us to better understand the opportunities of such an approach. Up to now, the idea was so general that most attention focused only on the risk that data would be lost from the decennial effort. Although considerable research and discussion are still needed, I believe there is growing interest and support for the approach. These efforts will continue in parallel to the 1995 Census Test and beyond because, as you know Mr. Chairman, it is not possible to test a continuous measurement system in a few sites at a single point in time.

Mr. Chairman, that concludes my testimony. Let me summarize by repeating that we are on schedule to test fundamental change for the 2000 census. We have a great deal of work ahead of us. The task we have set for ourselves—to reinvent the census—is an audacious one. We are quite aware of how difficult it will be to complete it, but I believe we are where we should be at this time. I will be happy to answer any questions.

Figure 1—The 1995 Census Test Fundamentally Different From the 1970, 1980, and 1990 Censuses

What	How	
	1970, 1980, 1990	1995 —> 2000
Address Lists .....	Compiled "from scratch" for each census...	Continually updated by the USPS, and local/other sources
Census Questionnaire .....	Machine-friendly; film-based capture.....	Respondent-friendly, electronic capture
Ways to Respond .....	Return questionnaire by mail Respond by mail (including replacement questionnaire); telephone, computer; questionnaires picked-up in convenient places.	
Nonresponse Up Follow-up .....	to six personal contacts for all questionnaires not mailed back.	Contact only a sample of nonrespondents; estimate for the rest (if legally allowed)
Identifying Vacant and Nonexistent Units .....	Two enumerator visits .....	First visit replaced by USPS carrier identification; enumerator visit before nonresponse follow-up
Statistical Estimation .....	Minimal for official results. Estimates of error produced after legal deadlines.	"One-number census"—single set of results combining counting and estimation by legal deadlines
Census Content .....	Collection of basic data for all persons, and detailed content from a sample, both considered as "given".	Collect basic data (specifically required by statute); and separate out detailed content by spreading collection through decade (Continuous Measurement)

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY CONGRESSMAN SAWYER TO HARRY A. SCARR

*Question 1.* When will the Bureau complete the actual design of the 1995 test (showing how all the pieces discussed today fit together)?

Answer. We now plan to document and issue our final test plans in December. Final decisions could not be made until the recent uncertainties about our FY 1994 budget were resolved. More detailed operational, sample, and system designs will be developed and documented over the coming months.

*Question 2A.* GAO is concerned about a lack of consensus on the Bureau's test design. What are the areas of greatest concern to stakeholders?

We distributed the Test Design Recommendations (TDR) to a wide range of stakeholders, and based on the comments we received, we were gratified that—with one major exception—there was consensus on our objectives. The one controversial area is our plans to expand the use of sampling and estimation in the census—in particular, plans for nonresponse follow-up sampling and plans for integrated coverage measurement (the “one-number” census).

*Question 2B.* How is the Bureau addressing those concerns?

Answer. We must continue our “open process” to document plans, trade-offs, risks, and opportunities to all those with a stake in the census design. We do not expect to gain consensus on these plans, but we do expect to ensure that all stakeholders understand what decisions we make and why we make them.

*Question 3A.* You mentioned the pilot project with the Postal Service. When do you expect those results?

Answer. The USPS and the Census Bureau are nearing the end of the first phase of an address information sharing pilot project. The two agencies established this pilot project, initially involving five 3-digit ZIP Code areas encompassing approximately 900,000 residential addresses, to develop the methodology for the full cooperative program that will create and continuously update a nationwide Master Address File (MAF) linked to the TIGER data base; both products are essential to support any 2000 census methodology.

In the first phase of the pilot project, the Census Bureau and the USPS each performed computer matches between their own address information and that of the other cooperating partner; the Census Bureau additionally matched address information from the USPS to the TIGER data base. Staff from each agency analyzed the results of these activities and met on November 9, 1993 to review the results. Their conclusions include:

- There are significant benefits to working cooperatively.
- Neither organization encountered any significant problems in receiving, reading, storing, or manipulating the automated address information provided by the other, and each successfully matched the address information provided by the other. Each learned about more effective ways to perform future matches and is adjusting its software accordingly.
- In matching the address information from the USPS to the TIGER data base to determine the census geographic code for each address, the Census Bureau achieved a higher match rate than it usually does with addresses from outside sources.
- The processes performed by the Census Bureau identified more than 3,500 unique street name representations associated with USPS addresses that did not match street name representations in the TIGER data base; this supports the fundamental assumption that a cooperative program between the two agencies will provide information needed to help keep the TIGER data base up to date.
- Census Bureau and USPS staff will complete map update activities for selected new streets identified by the automated address match in the first phase sites.

At this same meeting, the partners agreed that there would be benefit in conducting a second phase to the address information sharing pilot project. The second phase will consist of similar activities for the 1995 Census Test sites. The Census Bureau will request an amendment to the current Memorandum of Understanding once it has identified specific test sites.

Finally, the Census Bureau and the USPS agreed at the meeting to move forward quickly on efforts to determine needed changes in Titles 13 and 39 to permit both agencies to fully share, on a nationwide basis, the address information each maintains.

The Census Bureau and the USPS continue to implement related cooperative activities:

- Having provided to the USPS extracts from the TIGER data base equating 1990 census blocks with districts of the 103rd Congress to help the USPS determine the

number of mail drops for each district, the Census Bureau will continue providing updated information as several states establish new districts for the 104th Congress.

- The Census Bureau has provided TIGER/Line files with ZIP+4 Codes to support USPS pilot projects for automated restructuring of carrier routes.

- Staff from both agencies continue to discuss improved letter carrier/enumerator routing applications that will benefit the activities of both agencies.

*Question 3A.* When will the agencies be prepared to recommend legislative remedies, if necessary, to facilitate the exchange of address lists?

Answer. At this time, each agency is reviewing the various risks and opportunities of this concept. As mentioned above, we plan to develop any needed legislative initiatives by May 1994.

*Question 4A.* When will the Bureau begin to quantify the costs and benefits of its continuous measurement plan?

Answer. Cost estimation and modeling have been part of our efforts to date, and this will continue. For now, we have imposed a requirement that the design be "cost neutral" compared to providing similar data from a census. It is not yet clear what impact this constraint will have on the potential benefits of the continuous measurement system, but assuming the current fiscal climate likely will continue for some years, it does not seem realistic to start with a design costing more than a census. Of course, such cost comparisons will need to be revised over time as decisions are made about the goals and methods—and thus the costs—of the 2000 census.

*Question 4B.* What are the advantages and disadvantages of starting a continuous measurement-type program prior to the 2000 census? What are the advantages and disadvantages of waiting until after the 2000 census?

Answer. Small-area sample data from the 1990 census were released beginning in 1992. If the continuous measurement system is to replace some or all such data for 2000, we need to start full-scale data collection in 1999 so that sufficient sample cases can be accumulated by 2002. This schedule requires major planning and developmental work to begin this year. We can delay these efforts (and costs) with a later start, of course, but that also will delay the first release of small-area data.

*Question 4C.* What intercensal data collection models has the Bureau explored other than the continuous measurement design it is currently developing?

Answer. We are exploring ways to integrate ongoing data collection with our existing intercensal estimation programs. At the moment we envision blending this into the continuous measurement system beginning in 2003.

*Question 4D.* Has the Bureau ruled out a greater role for administrative records or other techniques that may be less expensive than the large sample survey called for under its continuous measurement design?

Answer. No. Although we have ruled out a "pure" administrative records census for 2000, we still hope to continue research on this (subject to funding) for the 2010 census. The intercensal estimation programs mentioned above make use of administrative records, and we hope to explore expanding such uses as part of long-range continuous measurement system development.

*Question 5A.* You discussed the need to address concerns about the level of accuracy of small area data if statistical sampling techniques are used in the next census. We know that block level accuracy is problematic, but at what level of geography does the quality become acceptable?

Answer. Stakeholders will vary in what they consider acceptable. The answer also depends greatly on the assumed sample size and design, and on assumptions about other key variables such as the mail response rate.

*Question 5B.* If that answer is not yet available, when will the Bureau know?

Answer. The Bureau plan to provide that type of information to stakeholders to facilitate discussion about acceptable levels of uncertainty?

We will make this information available over the next two years as we refine methodologies, cost estimates, and gain operational experience from the 1995 test. This will allow all stakeholders to assess the likely effects of different scenarios on the reliability of estimates for various subgroups and areas.

Mr. SAWYER. Thank you very much. It was a remarkable job of moving through an enormous amount of testimony hitting the high points.

Let me welcome Nye Stevens. It is good to have you back. I realize you are filling in for Bill Hunt. I hope he is feeling better. But in the meantime, it is nice to have you back, and if you need to look over your shoulder to get any questions answered, don't feel

uncomfortable about it. We know that you are always prepared when it is you that is on the job.

Mr. STEVENS. Well, thank you very much, Mr. Chairman.

Mr. SAWYER. If you would like to proceed, go right ahead.

Mr. STEVENS. I may very well take you up on that offer. It is my pleasure to be here. I haven't been here in over a year, I guess, mostly during your very effective oversight of the 1990 census and now we are here to talk about planning for the year 2000, which has long been on our minds.

I am dependent on the good work that has been done by our census audit staff. Jack Kaufman and Bruce Johnson are here, who represent that work. In its new recommendation for design of the 1995 test census, it is certainly true in our view that the Census Bureau has made some very promising proposals that do offer the potential of meeting the two overarching goals of both containing costs and simultaneously improving census accuracy. These are not business as usual proposals, by any means.

Most importantly, they recognize that traditional counting methods alone have exhausted their potential, a phrase that I think we have used before, for enumerating our diverse population, and they need to be supplemented with statistical methods that would apply to only a sample of the population.

In our view, the most promising proposals are to incorporate statistical estimation procedures into the basic census process by a one number census, to reduce the costly field work by sampling among the nonresponse population, to increase the public's cooperation by looking at respondent-friendly instruments and distribution methods, and to improve the address list by cooperating with the Postal Service on a continuing basis, and also using new technologies for data collection and processing.

We do believe and agree with your opening statement that this is real progress. And indeed we have been urging a number of these things in the past. I want to get into a few cautions we have now, because we do believe that fundamental census reform is still at risk. I don't want to sound overly negative, but I think GAO sometimes plays the role of saying yes, but. And that is how I would like these comments to be characterized.

First of all, the test proposals need to be supported by research and evaluation data that in many cases still needs to be obtained. The Bureau's plans to conduct research and evaluations for such proposals as the one number census, sampling for nonresponse, and defining the content of the census, are still in a state of flux.

Other important research and planning activity such as improving the address list and using the new automated techniques to convert respondent answers into machine readable format are behind schedule, in spite of the overall maintenance of schedule by the Bureau.

A second reason for concern and one that Dr. Scarr mentioned is that funding for research and test census preparations for fiscal year 1994 and 1995, is in doubt, as evidenced by the budget cut proposed by the House Appropriations Committee and the opinions that were expressed in their report. Funding increases to support the continuous measurement alternative are going to have to com-

pete with other funding needs which, as you certainly recognize, are going to be presented in a very tight budget environment.

A third reason for concern is that, despite the title of the test design recommendation, the Bureau still faces the difficult task of integrating these proposals into a detailed implementation plan for the 1995 test that develops specific field data collection procedures and experimental design and evaluation plans.

A fourth major risk to achieving fundamental breakthroughs is that the Bureau has not yet made in our view enough progress in building consensus with the Congress and with the key stakeholders and ultimately gaining the public support necessary for the major census innovations that Dr. Scarr described. Although the Bureau has conducted outreach and consultation efforts, and certainly it has been doing that, a review of these efforts indicates that they are still not at the point where a consensus can be claimed.

We again urge the administration, as we did in our testimony last May, to provide the leadership that is required to achieve the breakthroughs that are so necessary to containing the cost of the next census, while meeting that equally difficult goal with increasing its accuracy.

Supported and directed by the Department of Commerce and the Office of Management and Budget, the Bureau is going to have to make some tradeoffs and some compromises in the form of hard decisions. They are going to have to make these very soon in planning for the 1995 test census and in the related funding levels that will need to be requested for the 1995 budget.

Important decisions are needed soon on when to freeze the design of the 1995 test census, and to begin the detailed operational planning. Even though the research and evaluation and some of the consultation may not be as complete as originally contemplated, or as I am sure the Bureau would desire.

And lastly, these tradeoffs are going to involve deciding what is doable in the time remaining for the year 2000 census, and what needs to be put aside or deferred or put on a separate track for later years.

One final point. It appears still that a confirmed and appointed political level director for the Bureau is not going to be either formally nominated or confirmed before these tough decisions need to be made. And in our view, this situation puts additional pressure both on the career officials at the Bureau and those in both the Department of Commerce and OMB to make such decisions.

Normally, we would look to an appointed Census Bureau director to make these decisions. Eventually there will be one and we hope the same decisions are made when there is, but in the meantime, the absence of such leadership is another significant risk to achieving the kind of fundamental census reform that Dr. Scarr has so compellingly presented.

Thank you.

[The prepared statement of Mr. Stevens follows:]

PREPARED STATEMENT OF L. NYE STEVENS, DIRECTOR, PLANNING AND REPORTING,  
GENERAL GOVERNMENT DIVISION, U.S. GENERAL ACCOUNTING OFFICE

The Census Bureau's recently prepared 1995 Census Test Design Recommendation (TDR) contains promising proposals for fundamental breakthroughs to achieve the overarching goals of containing costs and improving accuracy. However, fundamental census reform remains at risk. The Bureau's research and evaluation efforts have been slowed by its changing planning strategy, and the Bureau still has the difficult task of integrating the TDR proposals into a detailed implementation plan for the 1995 test. The Bureau faces uncertainties in future funding, and it has been unable to obtain consensus among stakeholders. Another significant obstacle to achieving fundamental census reform is the lack of a nominated or confirmed Census Bureau Director. This situation puts additional pressure on both the career officials of the Census Bureau and the officials in the Department of Commerce and OMB who must make important decisions about the future of the decennial census over the coming months.

The Bureau's test proposals must be developed further into specific field data collection procedures and experimental design and evaluation plans. This effort must be supported by research and evaluation data that in many cases have yet to be obtained. Bureau plans to conduct research and evaluations for such promising proposals as the one-number census, sampling for nonresponse, and defining the content of the census are in a state of flux. Other important research and planning activities, such as improving the address list and using new automated techniques to convert respondent answers to machine-readable format, are behind schedule. Funding for research and test census preparation in fiscal years 1994 and 1995 is in doubt as evidenced by the budget cut proposed by the House Appropriations Committee and the opinions expressed in its report accompanying the fiscal year 1994 appropriation bill.

The Bureau has not made enough progress in building consensus with Congress and key stakeholders and gaining the public support necessary for major census innovations. Although the Bureau has been conducting outreach and consultation efforts, the type of comments received by the Bureau in response to its public notices and mailings to interested stakeholders, as well as comments received from several advisory committees, indicates to us that consensus still eludes the Bureau. The Bureau has received considerable support for its focused statement of goals for the next census—containing costs and improving accuracy—and its recognition that traditional census counting methods alone will be inadequate to achieve these goals. Nevertheless, there is no consensus emerging on how to achieve these overarching goals.

Mr. Chairman, Mr. Petri, and Members of the Subcommittee:

I am pleased to be here today to discuss the Census Bureau's progress in planning for the 2000 Decennial Census. You requested our assessment of the Census Bureau's final design choices for the 1995 census test. Specifically, you asked us to assess the Bureau's progress in analyzing data needs and the possible content of the 2000 census, as well as the status of testing alternative data collection methods; the Bureau's effectiveness in incorporating research results and consultations into its design; and the Bureau's ability to complete necessary preparations for the 1995 test. My testimony is based on our continuing audit work, at the Subcommittee's request, to monitor and evaluate 2000 census planning activities and operations.

The Bureau's recently prepared 1995 Census Test Design Recommendation contains promising proposals for fundamental breakthroughs. However, in view of the status of the Bureau's research and evaluation efforts, which have been slowed by its changing planning strategy, the uncertainties about future funding, and its inability to obtain consensus among stakeholders, we are concerned about whether the Bureau can design, implement, and properly evaluate the proposals in the planned 1995 test census.

CENSUS BUREAU PLANNING EFFORTS REFOCUSSED EARLIER THIS YEAR

We testified in March 1993<sup>1</sup> that a lack of Bureau progress in redesigning the 2000 census jeopardized the prospects of fundamental reform. Our view then was that the Bureau's strategy for identifying promising census designs and features was proving to be both time consuming and cumbersome and impaired the Bureau's ability to institute major innovations. We found that with the exception of its field

<sup>1</sup> See *Decennial Census: Fundamental Reform Jeopardized by Lack of Progress* (GAO/T-GGD-93-6, Mar. 2, 1993).



tests of methods to improve response rates, the Bureau had made limited progress on researching and developing the more promising major innovations for the next census.

In May 1993,<sup>2</sup> we testified again before your Subcommittee on the Bureau's progress. In that testimony we noted that the Bureau had altered its decisionmaking approach and taken steps to refocus its census research and development efforts, essentially reverting to an earlier approach previously documented by the Bureau in March 1991. In spite of the indirect path the Bureau followed in its planning process, we said that fundamental breakthroughs in census taking were still possible for the 2000 census. Specifically, we said that over the next 4 months the Bureau must intensively research and refine the design features that appear most promising in order to meet its September 1993 deadline for deciding what to test in 1995.

#### CENSUS BUREAU TEST DESIGN RECOMMENDATION CONTAINS PROMISING PROPOSALS

In early August 1993 the Bureau's planning staff prepared and disseminated for comment the 1995 Census Test Design Recommendation (TDR). The TDR contains proposed goals and methods for the 1995 census test. The Bureau states that the goal of the 1995 Census Test is to determine if the fundamental changes being considered for the 2000 census can contain costs and improve accuracy, especially in reducing the differential undercount between the minority and nonminority populations. The TDR and related Bureau research into ways to collect detailed data on the population throughout the decade (the "continuous measurement" alternative) also have stimulated thinking about the content of the census and how to satisfy the nation's demographic data needs.

In the TDR, the Bureau has responded to the concerns of many that in 1995 it focus on and plan to test features that offer the potential of fundamental breakthroughs in the next census. The Bureau states that counting methods have exhausted their potential for enumerating our diverse population. The Bureau acknowledges that there is little potential for reducing the differential undercount and containing census costs through traditional counting methods alone. It proposes supplementing these traditional methods, in which all persons have the opportunity to be counted, with statistical methods applying only to a sample of the population.

We believe the TDR contains proposals, the most important of which we have urged the Bureau to consider, that could provide fundamental breakthroughs to achieving these overarching census goals of containing costs and improving accuracy. The most promising Bureau proposals are to incorporate statistical estimation procedures into the basic census process by a "one-number" census, reduce costly field work by sampling for nonresponse, increase public cooperation, improve the address list used to mail questionnaires, and use new technologies to collect and process the data.

#### FUNDAMENTAL CENSUS REFORM STILL AT RISK

Despite the promising nature of these proposals, we are deeply concerned that the Bureau may not be in a position to properly test these proposals in 1995. For this reason, fundamental breakthroughs remain at risk. The Bureau's test proposals need to be supported by research and evaluation data that in many cases have yet to be obtained. Bureau plans to conduct research and evaluations for such proposals as the one-number census, sampling for nonresponse, and defining the content of the census are in a state of flux. Other important research and planning activities, such as improving the address list and using new automated techniques to convert respondent answers to machine-readable format, are behind schedule. Funding for research and test census preparations in fiscal years 1994 and 1995 is in doubt as evidenced by the budget cut proposed by the House Appropriations Committee and the opinions expressed in its report accompanying the fiscal year 1994 appropriation bill. Funding increases to support the continuous measurement alternative must compete with other funding needs in a very tight budget environment. Despite the title of "1995 Test Design Recommendation," the Bureau still faces the difficult task of integrating the TDR proposals into a detailed implementation plan for the 1995 test that develops specific field data collection procedures and experimental design and evaluation plans.

Another major risk to achieving fundamental breakthroughs is that the Bureau has not made enough progress in building consensus with Congress and key stakeholders and gaining the public support necessary for major census innovations. Al-

<sup>2</sup> See *Decennial Census: Focused Action Needed Soon to Achieve Fundamental Breakthroughs* (GAO/T-GGD-93-32, May 27, 1993).

though the Bureau has been conducting outreach and consultation efforts, our review of the comments the Bureau received in response to its public notices and mailings to interested stakeholders, as well as comments and reactions received from several advisory committees, indicates to us that consensus still eludes the Bureau. The Bureau has received considerable support for its focused statement of goals for the next census—containing costs and improving accuracy—and its recognition that traditional census counting methods alone will be inadequate to achieve these goals. Nevertheless, there is no consensus emerging on how to achieve these overarching goals.

#### LIMITED PROGRESS MADE ON RESEARCH AND ANALYSIS PUTTING PREPARATIONS FOR 1995 TEST CENSUS AT RISK

In the balance of my testimony I will discuss the specific proposals in the TDR that could result in fundamental breakthroughs and the risks that each of those proposals faces. I will assess first the Bureau's progress in analyzing data needs and possible content of the 2000 census, including the status of the continuous measurement proposal, which is a potential breakthrough. Then I will discuss four other areas offering potential breakthroughs—a one-number census, methods to reduce costly field work, improvements to the address list, and automated data capture technologies. I will focus in each discussion, as requested, on the status and effectiveness of research, consultations, and preparations for the 1995 test.

#### *Controversy Over Data Needs, Possible Census Content, and Alternative Data Collection Methods*

The design of the 1995 test census and the 2000 census itself depend in the first instance on the type and amount of data to be collected. Bureau consultations to date, however, reveal considerable disagreement over what data should be collected in the decennial census. As a result of this lack of consensus, the plans for testing alternative data collection methods may not be resolved quickly. This situation threatens both preparations for the 1995 test and the census itself.

With help from the Office of Management and Budget (OMB), the Bureau is attempting to determine the data content of the decennial earlier in the decade than was done before the 1990 census. OMB requested in mid-December 1992 that government agencies identify their data needs for the 2000 census and specify what data are required by statute and whether alternative data collection methods, such as continuous measurement, administrative records, or matrix sampling, could satisfy those needs. Although OMB requested a response by mid-February 1993, some of the major agency data users did not respond until several months later. Most had responded by June 1993.

During the period of time when the Bureau and OMB were assessing the agencies' responses, the House Appropriations Committee, in its report on the Bureau's fiscal year 1994 budget request, specified that only the data needed to satisfy statutory requirements should be collected at taxpayers' expense. The Committee stressed that the basic purpose for a decennial census is an enumeration of the population. For this reason the Committee said other data, which was collected in the 1990 census, could be collected, if needed, through alternative methods, such as statistical sampling or administrative records.

Despite slippage in the original schedule, the Bureau has made progress in examining the statutory and programmatic needs for census data since we last testified. Using the Committee's directive as a guidance, the Bureau has found that very few questions are statutorily required. The Bureau has determined that even basic data requested in a decennial census, such as age, race, sex, Hispanic origin, and household relationship, are not technically mandated at the smallest levels of geography, the block level. The Bureau believes, however, that these data should be collected at the block level because most of them have become an important part of the data used for congressional and state redistricting.

The Bureau has pointed out examples where decennial census data are the only data available to implement or administer various federal programs, even though the U.S. Code does not explicitly mandate the collection of data or does not mention the decennial census as the source of the data. Thus, the issue is to determine how broadly the concept of "statutorily required" should be interpreted. One agency, however, has pointed out that a strict interpretation of statutorily required data could result in government data users initiating legislation to require the collection of their data needs in a decennial census.

In response to the House Appropriations Committee's directive, the Bureau is considering revisions in its plan of collecting data in the 1995 test. Until the later part of July 1993, the Bureau had planned to collect the same data in the 1995 test as it

had in the 1990 census. The Bureau felt that this would allow it more time to better define the federal data needs and to gather information on the nonfederal data needs. In fact, the Bureau was considering plans for testing alternative ways to collect sample data through matrix sampling or delayed follow-up. A strict interpretation of what data are statutorily required, however, would obviate the need for testing ways to collect sample data, because an insufficient number of questions meet this threshold. On this basis and due to the possible use of continuous measurement, the Bureau has reserved judgment on plans to test alternative ways to collect the sample data collected in previous censuses. The prospect of reduced data content on the 1995 test census is proving controversial among users of census data.

#### *Continuous Measurement Faces Cost and Operational Hurdles*

Independent of 1995 Census Test plans, but definitely a part of the Bureau's strategy of collecting decennial data, the TDR discusses continuous measurement as an alternative to collecting detailed small-area data in the decennial census. Under the continuous measurement design the Bureau is currently considering whether the frequency of the data would vary depending on the size of the geographic area. Annual data would be available for states and large metropolitan areas. For places with populations of several thousands, small-area estimates would be averages of rolling accumulations of 5 years of data issued annually. Data users have expressed concerns that they would lose some of the detailed data of a decennial census, and they may not be able to do some of the crosstabulations that combine information from two questions (such as income data crosstabulated by race). Also, data users are concerned that the funding necessary to start and continue this type of undertaking would not be ensured.

The Bureau has not yet developed reliable cost estimates for continuous measurement, but some of the Bureau's preliminary estimates suggest that in the early years continuous measurement could cost as much as \$100 million annually. For this reason, the data users' concerns have merit, particularly in an austere budget environment and in light of the views expressed by the House Appropriations Committee. Thus, the Bureau must provide sound cost estimates for a 10-year cycle for both the continuous measurement alternative and the decennial census and demonstrate the relative costs and benefits to be derived from continuous measurement over the decade.

#### *Much Work Remains to Be Done on a One-Number Census*

A one-number census would supplement the results of the traditional headcount by statistical estimation to produce a single and best possible set of numbers by the legal deadlines. We believe such a census design offers several advantages. Primarily, a one-number census provides the potential of improving the overall accuracy of the counts and reducing the historically greater undercount of minorities. Statistical estimating methods, however, require technical calculations and assumptions that will undoubtedly be controversial. We are vividly reminded of the controversy and the difficulties the Bureau experienced using a post enumeration survey (PES). The PES was an attempt to estimate the coverage error for the 1990 census through a sample survey conducted after the Census Day, and use the results possibly to adjust the initial results.

The Bureau has much work remaining to advance the one-number census proposal. It must continue its technical research into the possible statistical error profiles of alternative methods to produce a one-number census. It must more fully develop the specific features of the methods to be tested in 1995. And, it must consult with Congress and the data users to determine their reaction to these methods.

The 1990 PES involved sampling about 165,000 households several months after Census Day and matching the information between the PES sample and the regular census questionnaires to determine the frequency of errors in the census. Although the PES has been tested under census conditions, the Bureau seems reluctant to reuse that method. Instead, the Bureau has proposed some other statistical estimating methods. However, it has not yet defined the actual design and operational concepts of these alternative methods. In fact, key Bureau statisticians have advised us that the possible designs are in a state of flux. This situation causes us to be concerned about the Bureau's ability to have sufficient time to adequately develop implementation procedures and an evaluation strategy in time to test the new statistical estimating methods in the 1995 test.

For this reason, we agree with the recommendation included in the interim report prepared by the National Academy of Science's Panel to Evaluate Alternative Census Methods that the Bureau should continue research efforts in perfecting the PES. We believe the Bureau's research should consider initiating the field data collection activities of the PES sample survey closer to Census Day to avoid some diffi-

culties; for example, by persons who move in the interim and problems caused by householders reconstructing their living situations on Census Day.

Regardless of what statistical estimating method is used, error in the counts at small geographic levels, such as blocks and combinations of blocks (census tracts), will still exist. As the size of the geographic area to be measured increases, however, the errors in the census data could be reduced significantly with these procedures. The statistical error at various geographical levels needs to be determined more precisely on the basis of Bureau research into the estimating methods under consideration. Also, the willingness of Bureau data users to accept error level at the smaller geographic levels must be explored.

*Some Promising Proposals to Reduce Costly Field Work Require Considerably More Research*

The Bureau's TDR includes several proposals for reducing costly field work. Significant progress has been made in finding ways to improve the design and presentation of the questionnaire to increase mail response by the public. Much more research remains to be done on the use of sampling for nonresponding households and the use of the Postal Service to identify vacant and nonexistent housing units.<sup>3</sup>

The cost and data quality of a census are dependent to a great extent on the public's cooperation in mailing back the census questionnaire. The 1990 mail response rate was about 10 percentage points lower than that experienced in 1980. As a result the Bureau spent significantly more to collect the data. The Bureau estimates that sending enumerators to these nonresponding households cost at least \$100 million, and many more millions of dollars were spent on indirect costs. It also has been well-recognized that data collected directly from households are more complete and accurate than the data collected when an enumerator is required to follow up on the nonrespondents.

The public's cooperation is dependent, in part, on the manner in which the questionnaire is designed and presented. To improve public cooperation through a better designed and presented questionnaire, the Bureau has conducted a series of tests. These tests prove a better response rate is possible when a simpler, shorter questionnaire designed in a respondent-friendly manner is used and when more mail contacts with the household are used.<sup>4</sup> This research has been extensive and has yielded valuable insights that will improve the cost and effectiveness of the next census.

Sampling for nonresponse has great promise in reducing the cost of following up those households which do not respond by mail. Recent Bureau cost estimates show that it could have achieved significant savings if it had used sampling for nonresponse in 1990. For example, if the Bureau had used a 10 percent sampling rate it could have saved as much as \$762 million in 1992 dollars. A 50-percent sample would have saved as much as \$347 million.

The Bureau currently is using 1990 census files to simulate the quality of census counts if sampling for nonresponse were used. This work was deferred until the Bureau had completed an evaluation of the possibility of sampling for the entire count, a concept that the Bureau later determined would not meet the constitutional requirement for an enumeration. The Bureau is now evaluating the statistical results of sampling 10 and 30 percent of the 1990 nonrespondents. Preliminary results were not available at the time we prepared our testimony, but Bureau officials have told us that considerable bias has been noted at the block level. This bias is considerably reduced at the census district office level (approximately 550,000 population) and above, particularly if the sampling is initiated several weeks after nonresponse follow-up efforts are started.

Considerably more research and evaluation are needed before implementation procedures can be developed for the 1995 test. For example, the Bureau needs to determine sampling rates, whether the sampling should be done by housing units or by whole blocks, when this sampling should be initiated (including whether percentage completion or a date certain should be used), how sampling should be integrated with one-number census statistical estimating procedures, and what instructions should be given the field staff implementing the sample of nonrespondents.

<sup>3</sup> We have advocated research and evaluation for both of these areas previously in our March and May testimonies and in our report *Decennial Census: 1990 Results Show Need for Fundamental Reforms* (GAO/GGD-92-94, June 9, 1992).

<sup>4</sup> GAO has long advocated this type of research. See *Decennial Census: Local Government Uses of Housing Data* (GAO/GGD-87-56BR, Apr. 8, 1987; *Decennial Census: Issues Related to Questionnaire Development* (GAO/GGD-86-74BR, May 5, 1986); *A \$4 Billion Census in 1990? Timely Decisions on Alternatives to 1980 Procedures Can Save Millions* (GGD-82-13, Feb. 22, 1982).

In the 1990 census, about 39 percent of the 34.3 million housing units that required personal visits were either vacant or nonexistent. We estimated that the Bureau spent about \$196 million visiting these vacant and nonexistent units in its nonresponse follow-up activities. We estimate that it spent another \$121 million rechecking the validity of the findings of its staff that certain units were vacant or nonexistent. For this reason, we believe the Bureau could achieve significant savings by using the Postal Service to identify these vacant and nonexistent units close to Census Day.

*Joint Efforts With Postal Service to Improve the Address List Are Lagging*

The Bureau's TDR proposes that its address list be continually updated by the Postal Service.<sup>5</sup> However, progress on joint efforts between the Census Bureau and the Postal Service is lagging.

A formal agreement was signed in November 1990 between the Postal Service and the Census Bureau to establish an interagency joint committee for census planning. One of the specific topics covered in that agreement was increased use of Postal Service automated systems for address list development and maintenance of census address files. However, only in April 1993, through the encouragement of this Subcommittee, did the Bureau and the Postal Service initiate a feasibility test of sharing automated address information on a long-term basis. Test results were originally to be provided in July 1993.

The two agencies did not sign a formal memorandum of agreement for the test until August 16, 1993, subsequent to the initiation of the test. Test results are now not expected until November 1993. One provision in this agreement allows for an extension of the test for some additional ZIP code areas to be mutually agreed upon by both parties. This provision could be applied to the 1995 test sites still to be chosen; however, another provision specifies that the agreement shall terminate within 6 months after the first Bureau address file is transmitted to the Postal Service for updating.

We suggested in our March testimony that the 1995 test would provide an excellent opportunity for evaluating the feasibility and usefulness of the Postal Service's information on vacant and invalid units. Also, the Bureau has to conduct field tests on how to reconcile the differences between the Postal Service's address list and its own automated address and geographic files. On the basis of progress to date and the provisions in the agreement, we are concerned about whether a sharing of automated address files will be operational for the 1995 test. Also, we are concerned whether a continually updated address file will be available for the proposed continuous measurement program.

*Opportunity to Test New Methods of Capturing Data Probably Lost for 1995 Test*

Another critical proposal in the TDR is employing in the 1995 test an electronic imaging system to capture census data from paper. In past censuses, the Bureau used a multiphased data capture system that required photographing census questionnaires, film processing, and computer translation in order to convert written responses to computer-readable form. Under the proposal, the Bureau plans to convert responses directly from paper to computer-readable form. This proposal could provide major opportunities for streamlining census processing operations. Also, it could provide a means for incorporating optical character recognition systems that would allow machines to read handwritten numbers and letters into the processing operation. The Bureau believes that this system has the potential to reduce the cost of the census and to improve both data quality and timeliness.

Unfortunately, according to a senior Bureau planning official, electronic data capture research has experienced many setbacks because of the problems involved in selecting a contractual agreement and in the lack of funding. As a result, new automated data capture methods will probably not be used in the 1995 test. The Bureau will probably resort to previously used data capture methods. It may be able to employ this method in a later period of time, although the opportunity will be lost in 1995 to test the interaction of the data capture and processing technologies with the field operations.

**ADMINISTRATION NEEDS TO MAKE FINAL 1995 PLANNING DECISIONS QUICKLY**

We again urge the administration, as we did in our May testimony, to provide the leadership required to achieve the breakthroughs so necessary to containing the cost of the next census while increasing its accuracy. Supported and directed by the De-

<sup>5</sup> We had recommended this in a 1980 report, *Problems In Developing The 1980 Census Mail List*, (GGD-80-50, Mar. 31, 1980).

partment of Commerce and the Office of Management and Budget, the Bureau will have to make tradeoffs and compromises very soon in planning the 1995 test census. These tradeoffs and compromises will involve important decisions about funding levels to be requested in 1995. They will involve important decisions about when to make final decisions and freeze the design of the 1995 test census and begin detailed operational planning, even though research and evaluation and other consultative processes may not be as complete as originally desired. Lastly, these tradeoffs will involve deciding what is doable in the time remaining for the 2000 census and what should be put aside, deferred, or put on a separate track for future census planning. Unfortunately, it appears that a Director for the Bureau will not be either formally nominated or confirmed before these decisions must be made. This situation puts additional pressure on both the career officials of the Census Bureau and the officials in the Department of Commerce and OMB. Normally, we would look to the Census Bureau Director for leadership in this issue. The absence of such leadership is a significant risk to achieving fundamental census reform.

This concludes my prepared statement. My colleagues and I would be pleased to answer any questions.

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RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY CONGRESSMAN SAWYER TO L. NYE STEVENS

*Question 1.* You mentioned that the Bureau has not made enough progress in building consensus with stakeholders. How might the Bureau better address the concerns of the stakeholders?

Answer. We testified that the Bureau has not made enough progress in building consensus with key stakeholders and with Congress, as well as gaining the public support necessary for major census innovations.

One source of stakeholders' concern is the lack of Bureau research and analysis that will help them come to conclusions about the wisdom of some major census innovations. We have described this lack of progress in our October testimony and previous testimonies to this subcommittee. We have described the Bureau's difficulties in (1) assessing governmental needs for decennial census data, (2) developing sound cost estimates of a continuous measurement alternative, (3) developing the details of alternative one-number census methods and sampling for nonresponse and assessing their potential effects on accuracy, and (4) analyzing the potential costs and benefits of increased use of the Postal Service to update and maintain the address list and associated geographic data files. Progress in research and analysis on these key issues will help develop an informed consensus.

Another source of concern is that the Bureau seems to lack consistency. The Bureau has changed course in how it is going about planning for the next census several times over the last several years. It started by examining design features, then it switched to examining design alternatives, then it returned to looking at design features, finally it settled on a Test Design Recommendation. The Bureau's method of announcing these changes in course has often left many stakeholders confused. The Bureau's budget justifications and supporting financial information seem to be constantly changing.

A third source of concern is the lack of an appointed Census Bureau Director and a confirmed Undersecretary of Commerce for Economic Affairs. Stakeholders must have some assurance that the decisions and pronouncements of the Bureau will be supported by future political leadership.

*Question 2.* You mentioned the need to explore stakeholder willingness to accept small geographic area error in census data if statistical sampling techniques are used. What type of information should the Bureau provide in order to facilitate an informed discussion of those concerns with stakeholders?

Answer. The first task for the Bureau is provide stakeholders with a baseline that describes the extent of small geographic error in the 1990 census. The National Academy of Sciences (NAS) Panel on Census Requirements in the Year 2000 and Beyond headed by Charles Schultze made this same recommendation in its interim report and we second that recommendation. Specifically, the Schultze panel recommended that the Bureau of the Census analyze Post-Enumeration Survey data to produce estimates of gross errors at the block level in the census. The panel also recommended that the Bureau also explore the error levels of successively larger geographic areas as block level data is aggregated to form census tracts, voting tabulation districts, and other small geographic areas for which census data is published. As the panel indicated such information would provide the basis for discus-

sion of what levels of accuracy for small data are needed in future censuses and how different census designs might affect the current levels of accuracy.

The Bureau needs to complete its assessment of the statistical effects of sampling for nonresponse by using simulations based on 1990 census data. As recommended by the NAS Panel to Evaluate Alternative Census Methods, chaired by Norman Bradburn, these simulations would explore the effects of different nonresponse follow up designs on costs and on the variance due to sampling at a variety of geographic levels from blocks to states.

The Bureau should compare the extent of variance due to sampling with the extent of gross errors at small geographic areas documented by the work recommended by the Schultze panel and discussed above. The hypothesis to be tested is whether the extent of gross errors is so large at small geographic areas that it greatly overshadows any error introduced by statistical sampling. As block level data is aggregated the variance due to sampling will decline. Gross errors may also vary by the size of the geographic area. This information would be very useful to data users who want to assess the effects of sampling on the reliability of their data.

The Bureau also should explore the potential effects on accuracy of the various one-number census methods under consideration, which may include the Super Census, Census Plus and the Post-Enumeration Survey, or some combination thereof. The Bradburn panel had a useful specific recommendation that the Bureau critically evaluate the Super Census method by using 1990 data to learn whether adequately precise coverage estimates are possible using ratios to the housing base.

The 1995 test census must be used to assess the relative accuracy of the different coverage methods under consideration for 2000. The Bradburn panel suggests 4 criteria for assessing these methods. They are: (1) acceptable degree of bias, (2) adequate precision (or variance) of the estimates for various levels of geography at a fixed cost, (3) operational and scheduling feasibility, and (4) the ability to demonstrate that the method meets the above 3 criteria. These are useful criteria. The Bureau would make a contribution to stakeholders by developing information that assess the alternatives against these criteria.

*Question 3.* (a) Had the Census Bureau adequately explored alternative intercensal data collection methods prior to selecting its continuous measurement design? (b) Do you believe the Bureau's continuous measurement design is the most promising intercensal data collection method to pursue at this time?

*Answer.* The Bureau has devoted considerable time, first in 1988 through 1990, and then again more recently looking at alternative data collection methods before selecting its current continuous measurement design. The problem has not been the adequacy of its explorations, but the assumptions upon which the current continuous measurement design is based. The Bureau's key assumption has been to design a continuous measurement system that can provide direct estimates throughout the decade for very small geographic areas, perhaps as small as census tracts, but at least as small as cities and counties and other comparably sized geographic areas. The key assumptions driving the design are that it be a "direct estimate" and that it yield substate level data on a regular basis.

We do not see how the Bureau will be able to design an affordable continuous measurement system requiring direct estimates for such small areas. Either the Bureau will have to accept the use of indirect estimates based on modeling and administrative record information (as opposed to questionnaires sent to households) or it will have to accept that it can measure directly only areas that are in the neighborhood of 100,000 people or larger.

For this reason, we do not believe the Bureau's continuous measurement design is the most promising intercensal data collection method to pursue at this time. Although we have not done sufficient work to say what single alternative should be pursued, we would like more effort to be given to some modifications and extensions of the existing intercensal estimates program of the Bureau. This program relies on indirect estimating techniques based on modeling and administrative records. It could be supplemented by increased research on administrative records that might provide additional demographic information beyond that now estimated as part of this program. Also, it is conceivable that some limited expansion of surveys could serve as the basis for modeling additional demographic characteristic data.

Mr. SAWYER. Thank you very much. Let me note the presence of the Honorable Tom Petri. We will turn to you in a moment as soon as we finish the testimony.

Dr. Bradburn.

Mr. BRADBURN. Thank you for this opportunity to return. In my testimony, I am going to first review briefly the panel's activity since I last testified, and then comment on the Bureau's design recommendations for the 1995 test and mention a few issues beyond what we will be considering in our final report.

You have seen our interim report which made a number of recommendations, 35 actually, regarding the 2000 census research and development program. And we appended the executive summary to testimony. The major theme in our report is that the dual objectives of reducing differential coverage and reducing census costs can't be achieved without expanding the use of sampling and statistical estimation.

Therefore we endorse the Bureau's stated goal of achieving a one number census in 2000 that incorporates results from counting, assignment and estimation methods into the official population totals. This approach offers several advantages over the dual strategy that was adopted in 1990.

A one number census is more cost-effective, less confusing and would, we believe, enjoy greater credibility with the American public. Also, because the single number design commits the Bureau to making decisions before the census is taken about what estimation methods will be used, it helps to forestall public concerns that count adjustments have been influenced by a desire to benefit certain geographic or demographic groups.

Also, we recommend continued research on nonresponse follow-up sampling and truncation, including consideration of a combined strategy with a truncated first stage and sampling during the second stage follow-up. Efforts to find people who failed to mail back their census forms proved to be a very costly and troublesome part of 1990 census.

Approximately \$378 million in direct costs, or 15 percent of the total cost of the census, was spent trying to find people who did not respond to the initial questionnaire. We believe the Census Bureau could save time and money by following up on only a portion of the addresses for which the form has not been returned. It also would be more cost-effective to stop all follow-up activities earlier than was done in 1990. Using either or both of these approaches could offer savings of hundreds of millions of dollars.

We believe the research and development of outreach and promotion should also be pursued with a level of energy comparable to what is being directed to other aspects of the census operations. We suggest more locally based outreach and promotion. While one of the principal objectives of the 2000 census is to improve the participation rate of African-Americans, Hispanics, American Indians, Alaska natives and other traditionally undercounted groups, we believe that a key goal for the 2000 census outreach and promotion program should be to identify ways of reaching the undercounted groups with a campaign that does not only announce the census, but also motivates minorities to participate.

Toward that end, we suggest that the Census Bureau evaluate its use of the Advertising Council to conduct a national pro bono media campaign. Alternatively, the Census Bureau could work directly with local and regional agencies also on a pro bono basis to better aim messages to particular groups. This approach would



allow the Census Bureau to supplement the campaign with paid advertising and to undertake a paid media research program to identify the most effective advertising messages.

The ethnographic studies conducted in conjunction with the 1990 census revealed a great deal about the sources of undercounting and overcounting among traditionally hard-to-enumerate populations. This work and the current research on living situations and census residence rules have potential for improving within household coverage and redoing the differential undercount. Findings from this research should be translated into census design components that would be tested and evaluated in 1995.

The Census Bureau is developing a prototype system for continuous data collection throughout the decade. In our interim report, we have not taken a definitive position on this alternative to the current form of the decennial census, but we do believe that the continuous measurement option shows sufficient promise to warrant further research and development.

Issues of census content are being considered more thoroughly by our cognate panel, the requirements panel. Our report includes a recommendation that promising designs such as multiple sample forms or the so-called matrix sampling could be tested and evaluated in 1995. This recommendation was premised on the 1995 census test collecting the same information that was gathered during the 1990 census.

We are aware that the Census Bureau has undertaken a review of the legislative status of current census content so our recommendation should be considered in conjunction with the findings of that review. If content in the 1990 census test reflects a significant reduction in the number of questions asked of respondents, then matrix sampling may offer few advantages and several potential disadvantages, e.g., increased cost and operational complexity.

Of the two recommendations in our report that are not directed to the Census Bureau, one calls for congressional action to facilitate the sharing of address lists between the Census Bureau and the Post Office. The two agencies have a history of cooperation on census-related activities, and we heard from Dr. Scarr that that is going on quite vigorously.

But in our view, new legislation would be needed to overcome some of the perceived obstacles and promote a closer partnership that permits more cost-effective address list development. Action on this recommendation would facilitate the establishment of a continuously updated register of addresses, that is the so-called master address file, something we have also called for in our interim report.

The second recommendation asks the Statistical Policy Office of OMB to recognize statistical uses of administrative records as one of its major areas of responsibility and to assume an active role in facilitating more effective working relationships between statistical and program agencies. We are encouraged by the recent cooperative efforts, for example, between the Census Bureau and the IRS, and we believe that OMB could play a constructive role.

In turning to the TDR in particular, the Census Bureau is considering an unprecedented level of innovation as we have heard. We are impressed by the unconstrained thinking demonstrated by the

Census Bureau staff in exploring alternative designs that represent fundamental change from traditional census methods. We believe that if properly designed and executed, one major contribution of the 1995 census test will be cost data on the innovations under consideration, for example, nonresponse follow-up sampling and truncation, application of a targeting model and tool kit, and new approaches to coverage measurement. Accurate information on cost and operational effectiveness is essential for making sound decisions in December 1995, based on the results of the census test, regarding the final design for 2000.

We note that some technical decisions regarding the 2000 census should be based on simulations using 1990 census data rather than on the 1995 test. One example is the question of what fraction of nonrespondents to the mail questionnaire should be followed up on a sample basis if this design feature is implemented in the 2000 census. This consideration will be important in constructing an efficient design for the 1995 test.

Use of telephone for nonresponse follow-up is not given a high profile in the TDR. We believe the Census Bureau should investigate the use of the telephone in the 1995 census test, either for reminders and/or for conducting follow-up activities. For the latter use, the Census Bureau should consider the possibility of mode effects, particularly when applying residence rules.

The idea of conducting telephone follow-up has surfaced periodically and was even tested successfully in the 1980 census. Preliminary results indicated that using the telephone provided several advantages over personal interviews: Cost per completed interview was lower, people answered more questions over the telephone, and fewer duplicate questionnaires were sent out. Using telephone follow-up would reduce the number of field enumerators required to complete follow-up activities. It may be a significant long-term benefit for the Census Bureau to staff regional offices with a centralized telephone facility.

The TDR explicitly mentions local administrative records but not Federal records such as those from the IRS or the Social Security Administration. However, in our joint discussions with the Census Bureau staff, they have expressed their intent to use Federal records as well as local records in the 1995 test.

The TDR does not clarify the status of the post-enumeration survey versus the SuperCensus and CensusPlus design. In our interim report, we note that the CensusPlus and SuperCensus methods for coverage measurement are not mature designs. Work is needed to define these options more fully so they can be subjected to simulation studies, field-testing and comparative evaluation against the post-enumeration survey.

An important issue that requires attention is how to evaluate coverage measurement methods for the 1995 census test. The difficult question here is what is truth? The possible complication is that the short time schedule for completing the test—i.e., a final decision on the 2000 census design is to be made by December 1995—might preclude extensive reinterviewing for assessment purposes.

We note that the bases for assessment of the 1990 census were demographic analysis and the PES. PES is the most reliable stand-

ard of measurement at this time, although technical issues of bias and variance in sampling still have to be addressed.

Now, just to close, I would like to mention a few topics that we have identified for further deliberation during the remaining life of our panel. We will consider several overall design issues for the 1995 tests. For example, how should split panels be used to meet needs for comparative evaluation without imposing excessive operational complexity on the test design? Also what methods should be used to evaluate various components of the test?

We plan to give more attention in our deliberations to gross or total census error; that is, omissions plus erroneous enumerations. At several points in our interim report we note the importance of the total error concept, for example, when we call for aggressive research and techniques to prevent erroneous and duplicate enumerations during the census when you have multiple response modes.

We believe that the census methodology should strive to minimize not only omissions that produce undercounts, but erroneous enumerations that produce overcounts. Considerations of total error may be helpful not only in determining which new methods merit development and testing, but also in identifying whether some programs or methods used in recent censuses ought to be discarded.

We will monitor progress on residence rules and roster research at the Census Bureau. We understand the results of this research should be available in early 1994.

We will also discuss issues regarding integration of census design components under development. How will methods for coverage measurement interact with nonresponse follow-up and truncation and with the so-called tool kit of special enumeration methods? How might administrative records be used in coverage measurement, in the targeting model and tool kit, or in a system for continuous data collection?

As noted on previous occasions, our mandate leads us to consider promising methods for the census not only in the year 2000 but also 2010 and beyond. For example, we will explore possible avenues for expanded use of administrative records with attention to matters of privacy, coverage, geography and content.

In conclusion, I want to thank you again for the opportunity to discuss research and planning for 2000. We hope that our findings and recommendations will contribute to achieving a sound design for the 2000 census and building a productive, long-term census research and development program. We look forward to continuing our studies with the encouragement and support of the Census Bureau and the Congress.

Thank you.

[The prepared statement of Mr. Bradburn follows:]

PREPARED STATEMENT OF NORMAN M. BRADBURN, CHAIR, PANEL TO EVALUATE ALTERNATIVE CENSUS METHODS, COMMITTEE ON NATIONAL STATISTICS, NATIONAL ACADEMY OF SCIENCES

#### INTRODUCTION

Good morning, Mr. Chairman and members of the Subcommittee. I am pleased to appear once again before the Subcommittee to discuss research and planning for the

2000 census. For the record, my name is Norman Bradburn. I am a professor of psychology and public policy at the University of Chicago and senior vice-president for research at the National Opinion Research Center. I serve as the chair of the Panel to Evaluate Alternative Census Methods (the "Methods Panel") of the National Research Council. The Research Council is the operating arm of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine, chartered by Congress to advise the government on matters of science and technology.

Our panel is engaged in one of two complementary studies begun in 1992 by the National Research Council's Committee on National Statistics (CNSTAT) in response to the Decennial Census Improvement Act of 1991 and at the request of the U.S. Department of Commerce and the Bureau of the Census. One study, being conducted by the Panel on Census Requirements in the Year 2000 and Beyond (the "Requirements Panel"), is considering what purposes a decennial census serves and whether alternative data collection systems can meet these objectives. The second study, being conducted by the Methods Panel, is focusing on how the census should be taken.

In my testimony, I will first review the panel's activities since I testified last March. Then, I would like to comment briefly on the Census Bureau's design recommendation for the 1995 test. Finally, I will mention a few issues that we will consider in our final report.

#### CNSTAT METHODS PANEL—RECENT ACTIVITIES

The Methods Panel has four basic tasks: (1) identify designs to be investigated for the 2000 census; (2) evaluate proposed research on alternative census designs; (3) evaluate the results of the research and the selection of census designs for further consideration, in particular for the series of census tests that begin in 1995; and (4) recommend census designs to be explored for 2010 and succeeding years.

The panel includes members with expertise in statistics, survey methods and design, decennial census operations, field organization of large-scale data collection, demography, geography, marketing research, administrative records and record linkage, small-area statistics, and respondent behavior. A list of panel members is appended to my testimony.

The panel has conducted much of its work through four groups that were formed to consider different aspects of alternative census designs: (1) sampling and statistical estimation; (2) response and coverage issues, including alternative enumeration methods; (3) administrative records; and (4) minimal content and multi-stage designs.

Since my last testimony before the Subcommittee in March of this year, the panel has met twice—on June 3-4, 1993 and on September 9-10, 1993. In addition, three working groups met in May 1993 to prepare material for our interim report. We began our June meeting by joining the meeting of the 2000 Census Task Force Advisory Committee, at which we heard presentations by the Census Bureau on the design alternative recommendations (DARs). We met afterwards in private session to review draft chapters of the interim report. During our September meeting, we discussed the 1995 test design recommendation (TDR) with Census Bureau staff. We also received briefings on census residence rules and roster research, alternative designs for sampling and truncation of nonresponse follow-up, recent work on continuous measurement, and the legislative status of current census content.

The administrative records working group is scheduled to meet on October 21-22, 1993. Our next full panel meeting has not yet been scheduled, but will take place in December 1993 or January 1994.

Our interim report, which was published last month, presents our findings and conclusions to date, many of which concern the 1995 census test. Our final report is scheduled to be completed in spring 1994.

Our panel and working groups continue to consult with Census Bureau staff and others, exchanging written correspondence as needed, and we have begun work with CNSTAT panel staff to prepare our final report. We thank the Census Bureau staff for their gracious accessibility and cooperation in providing information and materials for deliberations of our panel and its working groups.

#### A CENSUS THAT MIRRORS AMERICA: INTERIM REPORT

Our panel's report, *A Census That Mirrors America: Interim Report*, offers 35 recommendations regarding the 2000 census research and development program. The executive summary of the report is appended to my testimony. Many of the recommendations in the interim report are directed to plans for the 1995 census test. As

you know, the Census Bureau plans to make final decisions soon on the 1995 test design.

A major theme in our interim report is that the dual objectives of reducing differential coverage and reducing census costs cannot be achieved without expanded use of sampling and statistical estimation. Therefore, we endorse the Census Bureau's stated goal of achieving a one-number census in 2000 that incorporates results from counting, assignment, and estimation methods into the official population totals. This approach offers several advantages over the dual strategy that was adopted for the 1990 census. A one-number census is more cost-effective, less confusing, and would enjoy greater credibility with the American public. Also, because the single-number design commits the Census Bureau to making decisions before the census is taken about what estimation methods will be used, it forestalls public concerns that count adjustments have been influenced by a desire to benefit certain geographic or demographic groups.

Also, we recommend continued research on nonresponse follow-up sampling and truncation, including consideration of a combined strategy with a truncated first stage and sampling during a second stage of follow-up. Efforts to find people who failed to mail back their census forms proved to be a very costly and troublesome part of the 1990 census. Approximately \$378 million in direct costs, or 15 percent of the \$2.6 billion cost of the census, was spent trying to find people who did not respond to the initial questionnaire.

We believe the Census Bureau could save time and money by following up on only a portion of the addresses for which the form has not been returned. Also, it would be more cost-effective to stop all follow-up activities earlier than was done in 1990. Using either or both of these approaches—sampling and truncation—could offer savings in the hundreds of millions of dollars.

We believe that research and development of outreach and promotion should be pursued with a level of energy comparable to what is being directed to other aspects of census operations. We suggest more locally-based outreach and promotion. One of the principal objectives of the 2000 census is to improve the participation rate of African Americans, Hispanics, American Indians, Alaska natives, and other traditionally undercounted groups. We believe that a key goal for the 2000 census outreach and promotion program should be to identify ways of reaching the undercounted groups with a campaign that does not only announce the census, but also motivates minorities to participate. Toward that end, we suggest that the Census Bureau evaluate its use of the Advertising Council to conduct a national pro bono media campaign. Alternatively, the Census Bureau could work directly with local and regional agencies, also on a pro bono basis, to better tailor messages to particular groups. This approach would allow the Census Bureau to supplement the campaign with paid advertising and to undertake a paid media research program to identify the most effective advertising messages.

The ethnographic studies conducted in conjunction with the 1990 census revealed a great deal about the sources of undercounting and overcounting among traditionally hard-to-enumerate populations. This work and current research on living situations and census residence rules have potential for improving within-household coverage and reducing the differential undercount. But the findings from this research should be translated into census design components that can be tested and evaluated in 1995.

The Census Bureau is developing a prototype system for continuous data collection throughout the decade. In our interim report, we have not taken a definitive position on this alternative to the current form of the decennial census, but we do believe that the continuous measurement option shows sufficient promise to warrant further research and development.

Issues of census content are being considered more thoroughly by our sibling panel, the Requirements Panel. However, our report includes a recommendation that promising designs using multiple sample forms (i.e., so-called "matrix sampling") be tested and evaluated in 1995. This recommendation was premised on the 1995 census test collecting the same information that was gathered during the 1990 census. We are aware that the Census Bureau has undertaken a review of the legislative status of current census content. Our recommendation should be considered in conjunction with the findings of that review. If content in the 1995 census test reflects a significant reduction in the number of questions asked of respondents, then matrix sampling may offer few advantages and several potential disadvantages—e.g., increased cost and operational complexity.

Of the two recommendations in our report that are not directed to the Census Bureau, one calls for congressional action to facilitate the sharing of address lists between the Census Bureau and the Post Office. The two agencies have a history of

cooperation on census related activities, but in our view, new legislation will be needed to overcome some perceived obstacles and to promote a closer partnership that permits more cost-effective address list development. Action on this recommendation would facilitate the establishment of a continuously updated register of addresses (a "master address file"), something we also call for in the interim report.

The second recommendation asks the Statistical Policy Office in the Office of Management and Budget (OMB) to recognize statistical uses of administrative records as one of its major areas of responsibility and to assume an active role in facilitating more effective working relationships between statistical and program agencies. We are encouraged by recent cooperative efforts, for example, between the Census Bureau and the Internal Revenue Service, and we believe that OMB could play a larger constructive role.

#### CENSUS BUREAU 1995 TEST DESIGN RECOMMENDATION

In planning for the 2000 census, the Census Bureau is considering an unprecedented level of innovation that is reflected in the 1995 census test design recommendation (TDR). We are impressed by the unconstrained thinking demonstrated by Census Bureau staff in exploring alternative designs that represent fundamental change from traditional census methods.

We believe that, if properly designed and executed, one major contribution of the 1995 census test will be cost data on the innovations under consideration—e.g., non-response follow-up sampling and truncation, application of the targeting model and tool kit, and new approaches to coverage measurement. Accurate information on cost and operational effectiveness will be essential for making sound decisions in December 1995, based on the results of the census test, regarding the final design for the 2000 census.

We note that some technical decisions regarding the 2000 census should be based on simulations using 1990 census data rather than on the 1995 census test. One example is the question of what fraction of nonrespondents to the mail questionnaire should be followed up on a sample basis (if this design feature is implemented in the 2000 census). This consideration will be important in constructing an efficient design for the 1995 census test.

The use of telephone for nonresponse follow-up is not given a high profile in the TDR. We believe the Census Bureau should investigate use of the telephone in the 1995 census test either for reminders or for conducting follow-up activities. For the latter use, the Census Bureau should consider the possibility of mode effects, particularly when applying residence rules.

The idea of conducting telephone follow-up has surfaced periodically and was even tested successfully in the 1980 census. Preliminary results indicated that using the telephone provided several advantages over personal interviews: the costs per completed interview were lower; people answered more questions over the telephone; and fewer duplicate questionnaires were sent out. Using telephone follow-up also would reduce the number of field enumerators required to complete follow-up activities. And there may be significant long-term benefits for the Census Bureau to staff regional offices with a centralized facility for computer-assisted telephone interviewing.

The TDR explicitly mentions local administrative records but not federal records, such as those from the Internal Revenue Service and Social Security Administration. However, in our joint discussions, Census Bureau staff have expressed their intent to use federal records as well as local records in the 1995 census test.

The TDR does not clarify the status of the post-enumeration survey (PES) versus the SuperCensus and CensusPlus designs. In our interim report, we note that the CensusPlus and SuperCensus methods for coverage measurement are not mature designs. Work is needed to define these options more fully so that they can be subjected to simulation studies, field testing, and comparative evaluation against the post-numeration survey.

Another issue that will require attention is how to evaluate coverage measurement methods in the 1995 census test. The difficult question is "What is truth?". A possible complication is that the short time schedule for completing the test—i.e., a final decision on the 2000 census design is to be made in December 1995—might preclude extensive reinterviewing for assessment purposes. We note that the bases for assessment of the 1990 census were demographic analysis and the post-enumeration survey (PES). The PES is the most reliable standard of measurement at this time, although technical issues of bias and sampling variance must be addressed in application.

Next, I would like to mention some of the topics that we have identified for further deliberation during the panel's remaining months prior to issuing our final report.

We will consider some overall design issues for the 1995 census test. For example, how should split panels be used to meet needs for comparative evaluation without imposing excessive operational complexity on the test design? Also, what methods should be used to evaluate various components of the 1995 test?

We plan to give more attention in our deliberations to gross or total census error—that is, omissions plus erroneous enumerations. At several points in our interim report, we note the importance of the total error concept—for example, when we call for aggressive research on techniques to prevent erroneous, duplicate enumerations during a census with multiple response modes. We believe that census methodology should strive to minimize not only omissions (that produce undercounts) but also erroneous enumerations (that produce overcounts). Considerations of total error may be helpful not only in determining which new methods merit development and testing, but also in identifying whether any programs or methods used in recent censuses ought to be discarded.

We will monitor progress on residence rules and roster research at the Census Bureau. We understand that results from this research should be available in early 1994.

We will also discuss issues regarding the integration of census design components under development. How will methods for coverage measurement interact with non-response follow-up sampling and truncation and with the so-called "tool-kit" of special enumeration methods? How might administrative records be used in coverage measurement, in the targeting model and tool kit, or in a system for continuous data collection?

As we have noted on previous occasions, our mandate leads us to consider promising methods for the census not only in the year 2000, but also for 2010 and beyond. For example, we will explore possible avenues for expanded use of administrative records, with attention to matters of privacy, coverage, geography, and content.

In closing, I thank you for the opportunity to discuss research and planning for the 2000 census. We hope that our findings and recommendations will contribute toward achieving a sound design for the 2000 census and building a productive, longer-term census research and development program. We look forward to continuing our studies with the encouragement and support of the Census Bureau and of Congress.

## A CENSUS THAT MIRRORS AMERICA: INTERIM REPORT

### EXECUTIVE SUMMARY

Two major criticisms were levelled against the 1990 census: (1) unit costs increased significantly, continuing a trend that began with the 1970 census; (2) the problem of differential undercount by race persisted and even worsened, despite a large investment in coverage improvement programs (see, e.g., U.S. General Accounting Office, 1992). In response to these criticisms, the Census Bureau is considering an unprecedented level of innovation for the 2000 census.

In this interim report we concentrate on those aspects of census methodology that have the greatest effect on these two primary objectives of census redesign: reducing differential undercount and controlling costs. Therefore, we focus on processes for the collection of data, the quality of coverage and response that these processes engender, and the use of sampling (and subsequent estimation) in the collection process.

Census data collection involves four key steps: (1) the construction of an address frame; (2) an initial process to obtain responses that can be linked to the address frame; (3) a follow-up process to obtain responses from those not covered in the initial process; and (4) a coverage assessment process that estimates the size of the population not covered through the initial and follow-up processes. In the 1990 and earlier censuses, the first three steps led to the official census estimates; whether or not to incorporate the estimates from the fourth step into the official census estimates became the "adjustment issue." For the 2000 census, the Census Bureau is proposing a fundamentally different approach, called a "one-number census." The one-number census describes an approach that regards this fourth step as an integral part of the census process that leads to the official estimates.

The design of a census data collection process in essence amounts to deciding which methods of identification, enumeration, response, and coverage improvement should be applied at each of the steps; whether sampling methods (and the corresponding estimation methods) should be used at any of the four steps; and if sampling methods are used, which methods and at which steps. These decisions have to be based on information about the effectiveness and costs of the various alternative methods. The 1995 census test should be a prime source of such information.

In this report we present 35 recommendations that address a broad range of issues with varying degrees of complexity and urgency. Below we present the recommendations organized by the primary intended audience and the associated time frame. (The numbering below follows that of the body of the report.) All but two of our recommendations are directed to the Census Bureau, 15 are specifically directed toward the 1995 census test, and 18 are directed toward longer range issues.

#### ADDRESS LIST DEVELOPMENT AND USE OF ADMINISTRATIVE DATA

Of the two recommendations not directed to the Census Bureau, one calls for congressional action to facilitate cooperative efforts at address list development.

Recommendation 1.3: Congress should enact legislation that permits the sharing of address lists between the Census Bureau and the U.S. Postal Service for the purpose of improving the Census Bureau's master address file.

The second recommendation asks the Office of Management and Budget to assume greater responsibility for statistical uses of administrative records.

Recommendation 4.1: The Statistical Policy Office in the Office of Management and Budget should recognize statistical uses of administrative records as one of its major areas of responsibility and should assume an active role in facilitating more effective working relationships between statistical and program agencies and in tracking relevant legislation.

#### ONE-NUMBER CENSUS

One key message is that the dual objectives of reducing the differential undercount and controlling costs will require expanded use of sampling and statistical estimation. This theme is prominent in the recommendations regarding the development and testing of coverage measurement methods.

Recommendation 2.3: We endorse the Census Bureau's stated goal of achieving a one-number census in 2000 that incorporates the results from coverage measurement programs, including programs involving sampling and statistical estimation, into the official census population totals. We recommend that research on alternative methodologies continue in pursuit of this goal.

#### THE 1995 CENSUS TEST

Many of our recommendations address the 1995 census test, including preliminary research that would inform the design of the test.

##### *Coverage Measurement*

Recommendation 2.4: Before final design of the 1995 census test, the Census Bureau should critically evaluate the SuperCensus method of coverage measurement by using 1990 data to learn whether adequately precise coverage estimates are possible using ratios to the housing base.

Recommendation 2.5: Development and testing methodology for the Post-Enumeration Survey (PES) should continue in parallel with other methods until another method proves superior in operational tests. All methods still under consideration—including the PES—should be evaluated critically against common criteria.

##### *Sampling*

We call for experimentation in the 1995 census test with the use of sampling to follow up people who do not respond to the initial mail questionnaire and to collect additional information on the census form.

Recommendation 2.1: The Census Bureau should continue research on nonresponse follow-up sampling and truncation, including consideration of a combined strategy with a truncated first stage and sampling during a second stage of follow-up. Evaluation should consider effects of the nonresponse follow-up design on costs and on variance at a variety of geographic levels, from states to small areas.

Recommendation 2.7: The Census Bureau should continue research on possible matrix sampling designs, using the 1990 census data to simulate tabulations



and crosstabulations. Design(s) that appear most promising should be tested in 1995 to permit evaluation of their performance in combination with other census design features under test.

#### *Questionnaire Design and Telephone Follow-Up*

We make several recommendations with respect to questionnaire design and implementation in the 1995 census test, including use of the telephone to contact persons who do not respond to the initial mailing.

Recommendation 3.1: At this time, the Census Bureau should not initiate any further large-scale experiments designed to improve the initial mail response rate. Instead, response improvement research should now consolidate findings from research conducted to date in order to design experiments for the 1995 census test. The primary objective of these experiments should be to identify optimal field procedures that combine features such as advance notification, replacement questionnaires, and telephone follow-up.

Recommendation 3.2: The prospect of having telephone numbers for a large percentage of households in the 2000 census is a potentially important development that should be explored in the Census Bureau's 1995 test—for example, by using the telephone for reminder calls and nonresponse follow-up.

Recommendation 3.12: When developing and applying residence rules, the Census Bureau should consider both the need to accurately enumerate diverse household structures and the potential for mode effects when an instrument is implemented in both self-administered and interviewer-administered forms. In particular, the Census Bureau should simultaneously develop enumeration forms designed for self-administration and telephone administration for use in the 1995 census test. The comparability of these forms should subsequently be evaluated on the basis of 1995 census test results.

#### *Outreach and Promotion*

The panel believes that greater attention should be given to census outreach and promotion and to enumeration methods targeted at historically hard-to-count segments of population. In particular, testing of candidate programs and methods should take place in 1995.

Recommendation 3.5: The Census Bureau should establish an ongoing research and development program for decennial census outreach and promotion. The 1995 census test provides an excellent opportunity to conduct and evaluate promising media campaigns and local outreach programs.

Recommendation 3.8: The Census Bureau should consider developing an extensive network of relations between field offices and local community resources. This infrastructure would be maintained in continuous operation between and during census years. The Census Bureau should develop and implement pilot programs in conjunction with the 1995 census test in order to gather information about the potential costs and benefits of a large-scale local outreach program.

Recommendation 3.10: In the 1995 census test, the Census Bureau should evaluate specific measures and procedures that might improve the enumeration of historically undercounted populations. Candidates for study in 1995 should include a larger repertoire of foreign-language materials (both written and audio), more aggressive hiring of community-based enumerators, and greater flexibility in the timing of enumeration (i.e., contact during evenings and weekends). In particular, the Census Bureau should examine the efficacy of moving census day to the middle of the month.

#### *Administrative Records*

We note the importance of testing methods that could expand the use of administrative records for statistical purposes. This research will require cooperation between the Census Bureau and agencies that maintain relevant administrative record systems.

Recommendation 2.2: The Census Bureau should study in the 1995 census test the use of administrative records during nonresponse follow-up as a way to reduce the need for conventional follow-up approaches.

Recommendation 4.3: As part of the 1995 census test, the Census Bureau should construct an administrative records database for the test sites.

Recommendation 4.4: The Census Bureau should establish the testing of record linkage procedures as an important goal of the 1995 census test.

Recommendation 4.5: In preparation for uses of administrative records in the 1995 census test, detailed negotiations between the Census Bureau and the other relevant agencies should begin immediately, with the involvement of the

Statistical Policy Office of the Office of Management and Budget (see also Recommendation 4.1).

### *Address List Development*

The construction of an address list is a central element in decennial census operations, and the panel believes the potential benefits are sufficient to justify development, starting in fiscal 1994, and maintenance of a continuously updated address file linked to a geographic database.

Recommendation 1.1: The Census Bureau should continue aggressive development of the TIGER (topologically integrated geographic encoding and referencing) system, the master address file (MAF), and integration of these two systems. TIGER/MAF updating activities should begin in fiscal 1994 and should concentrate first on the sites selected for the 1995 census test.

### THE 2000 CENSUS

In addition to recommendations for the 1995 census test, two recommendations refer explicitly to the 2000 census—one proposing a goal for coverage measurement, the other urging consideration of available telephone technology. A third recommendation concerns organizational change to facilitate management of decennial census outreach and promotion.

Recommendation 2.6: Whatever coverage measurement method is used in 2000, the Census Bureau should ensure that a sufficiently large sample is taken so that the single set of counts provides the accuracy needed by data users at pertinent levels of geography.

Recommendation 3.7: The Census Bureau should investigate developing a menu-driven touchtone call routing system for the 2000 census that gives callers to the Census Bureau's toll-free help line quicker access to the specific assistance they want.

Recommendation 3.3: The Census Bureau should assign overall responsibility for decennial census outreach and promotion to a centralized, permanent, and nonpartisan office. The Census Bureau should consider expanding the mission of the extant Public Information Office to include this charge. Evaluation of outreach and promotion programs should be conducted by an independent unit within the Census Bureau.

### FURTHER RESEARCH

The remainder of the recommendations endorse topics for further research throughout this decade. This research might inform the 1995 census test, the 2000 census, or census design beyond 2000. These recommendations cover methods for linking records from one or more sources—that is, mail questionnaires, telephone or personal interviews, or administrative data systems—aimed at improving census accuracy by reducing both omissions and erroneous enumerations, the use of sampling and statistical estimation, outreach and promotion, racial and ethnic classification, the long-term use of administrative records, and continuous data collection.

### *Record Linkage*

Recommendation 1.2: The Census Bureau should aggressively pursue its research program on record linkage.

### *Sampling and Statistical Estimation*

Recommendation 2.8: The Census Bureau should vigorously pursue research on statistical estimation now and throughout the decade. Topics should include nonresponse follow-up sampling, coverage estimation, incorporation of varied information sources (including administrative records), indirect estimation for small areas, and matrix sampling.

Recommendation 2.9: The Census Bureau should develop methods for measuring and modeling all sources of error in the census and for showing uncertainty in published tabulations or otherwise enabling users to estimate uncertainty.

### *Outreach and Promotion*

Recommendation 3.4: The Census Bureau should commit the resources necessary to develop and implement customized, local outreach programs to target the traditionally undercounted ethnic minorities. The Census Awareness and Products Program (CAPP) should be expanded and sustained on an ongoing basis, so that it can serve as the primary vehicle for the design and implementation of these outreach programs.

Recommendation 3.6: The Census Bureau should evaluate the use of the Advertising Council to conduct the census media campaign. The Census Bureau should consider the alternatives of working directly with local and regional agencies, undertaking paid media research, and supplementing pro bono advertising with paid advertising in hard-to-enumerate localities.

#### *The Differential Undercount and Racial and Ethnic Classification*

Recommendation 3.9: The Census Bureau should conduct further comparative studies of hard-to-numerate areas, focusing on those parts of the country where three phenomena coincide: a shortage of affordable housing, a high proportion of undocumented immigrants, and the presence of low-income neighborhoods.

Recommendation 3.11: The Census Bureau should consider a major program of research in cognitive anthropology, sociology, and psychology that will comprehensively examine the issue of racial and ethnic identity. This research would contribute to the development of more acceptable racial and ethnic identification questions. In particular, the Census Bureau should consider experimenting with allowing people to select more than one race category in the 1995 census test.

#### *Use of Administrative Records*

Recommendation 4.2: The Census Bureau should initiate a systematic process of consultation and research to explore the attitudes of the public, political representatives, and other opinion leaders about the use of administrative records as an integral part of the census. Previous consultations and existing research, such as the yet-to-be-released 1990 Taxpayer Opinion Survey, should be taken into account.

Recommendation 4.6: The Census Bureau should establish a formal program of long-range research and development activities relating to expanded use of administrative records for demographic data.

#### *Continuous Data Collection*

Recommendation 5.1: The Census Bureau should continue to explore the feasibility of a continuous measurement component to the 2000 census.

Recommendation 5.2: The Census Bureau should establish a formal set of goals for a continuous measurement program. The Census Bureau should then establish a research plan to determine the extent to which these goals are achievable.

Recommendation 5.3: The Census Bureau should undertake an extensive and systematic evaluation of the benefits from having more frequent census data available for both large and small geographic areas.

Recommendation 5.4: The goals for a continuous measurement program (see Recommendation 5.2) should include phasing in the continuous measurement program during the latter half of the decade prior to the relevant census year.

Recommendation 5.5: As part of its research into the feasibility of and methods for implementing a continuous measurement program, the Census Bureau should undertake a thorough study of the consequences of changes in the instrument over time, as well as changes in mode effects. A plan must be established for incorporating the effects of such changes into the cumulated estimates and into the time series produced by the continuous measurement program.

Mr. SAWYER. Thank you very much, Dr. Bradburn. I think it is fair to say that your findings and recommendations already have contributed to that goal. I will tell you, I am tempted just to say, "do any of you have anything to say to one another, after what you've heard this afternoon?" But I am afraid we might go on at some greater length than any of us are prepared to do.

Let me just talk about a couple of things that are critical right now. Dr. Scarr, particularly from your point of view, we face the potential effects of a very substantial cut, as the House has suggested. And you mentioned a number of items that might potentially be cut and limiting the tests to a very specific group of items.

You didn't mention the technology on which some, if not a great fraction, of the success that we hope for in 2000 would depend. Can you talk about implications of not having the technology to support

some of the basic census operations that you have built into your planning?

Mr. SCARR. Mr. Chairman, I think the principal technology is the development of what we call the DCS 2000 method. Fundamentally, if we are unable to engage in the research and development program for that, the data capture will basically be what the data capture was in 1990, a system that relied on microfilm. What we are hopeful for in the DCS 2000 technology is to have digitized data capture of a user-friendly questionnaire, be able to do the edits and so on and so forth much more efficiently.

The simple answer is, in the absence of that, we will probably be thrown back on using the FOSDIC system. The FOSDIC system was probably better than its reputation, but not as good as we would like it to be for the year 2000. But that is basically where we are.

I think of the fundamental changes I described with respect to the lower or with respect to the House Appropriations Committee mark as the following:

If you think of two basic trains of research, one train looks at estimation and the other looks at coverage and coverage improvement. You recall we really need to do coverage improvement as well, because the world has changed and we have to hold our own there.

Basically what that amount of money implies is this: We will go down the sampling track, but basically the coverage track will be eliminated. That is, in a nutshell, the sort of thematic description of what we are looking at with the 8.1 million.

Mr. SAWYER. Let me assume that the worst happens. Is there any opportunity to accordon the activities into a later budget period when you might be able to alter the timing of the planning and the tests in order to take advantage of greater flexibility in the use of dollars?

Mr. SCARR. I think that is a bad trade. I think the whole reason for the task force and for the design effort was so that major changes could be tested early enough in the decade to make decisions about implementing them for the 2000 census. I think December 1995 is really as late as we want to go. Of course, I can't forecast the future and I don't know what the budget numbers will look like.

We will, under the circumstance, do the best we can to ensure the integrity of the program, but basically in my judgment, and I think in the judgment of our research staff, that is a bad trade-off. Because that defeats the purpose of basically the way the exercise was designed.

Mr. SAWYER. I don't disagree with that answer. Mr. Stevens, would you have any comment on the question or answer?

Mr. STEVENS. Yes, I would fundamentally agree with that, too, that there—we would—if we had to choose, we would choose between cutting out some of the more innovative features that the Bureau is thinking of not being able to pursue, rather than push it later into the cycle because you are going to destroy your ability to apply these lessons in the year 2000. And a number of these costs would not really be saved, they would just be deferred until later.

Mr. SAWYER. On a broader scale, has the Bureau got its research program about on mark or are they trying to do too much, are they trying to do too little? When we look at the split that Dr. Scarr just described, would you concur essentially in that split?

Mr. STEVENS. I think we would. With the budget, the budget situation of course is going to call for some very tough choices. And again, I wouldn't disagree with the priorities that are implicit in Dr. Scarr's statement.

If there were one that perhaps is less important in our estimation than the four or five others he mentioned, it would perhaps be the research into the more user-friendly questionnaire, simply because so much of that has been done.

That has been known to be a problem for a number of years and perhaps the marginal effect of expenditures in that area are less than in some of the more path-breaking suggestions.

Mr. SAWYER. Dr. Bradburn, would you concur with the two or three most important areas that have been identified?

Mr. BRADBURN. Pretty much. I guess the—I do just want to emphasize Dr. Scarr's concern about the optical scanning or the digitized data capture you need in order to get the real progress you get with the user-friendly forms. One just can't really overestimate the effect that it is going to have in a whole variety of ways, both in improving accuracy and in reducing cost. I think it really will substantially increase the mail back, which will reduce costs enormously.

But it is just simply unacceptable to us, the idea that you should go again with something that can't optically read that kind of form. I mean, technology in that area is really moving ahead so rapidly, we have just got to get that done.

Mr. SAWYER. You would suggest that that is absolutely central?

Mr. BRADBURN. That is absolutely central. That of course can go on, that doesn't affect the 1995 test, because you don't have to actually have it for the 1995 test. But it would also help a lot, of course, on getting some better handles on costs, if you could actually incorporate it then. But I don't think it will be ready by then. Just I would be sure that it is ready by 2000.

In terms of the other things, I think the kind of priorities that I put down were similar to the ones that Dr. Scarr mentioned, with possibly two exceptions. One that we noted, and maybe they don't view it as problematic, is telephone follow-up of the nonresponse.

I think there are issues there which really need to be examined in the 1995 test because the committee, our panel, feels that telephone follow-up offers substantial opportunities for cost reduction, cost savings. And we think this is much more important than alternative modes of responding initially. In fact, some of the proposals to be tested—and I think they are probably worth testing, although I think our priors are strongly that they are not going to—are going to be counterproductive even.

Having multiple ways in which you could start the process of enumeration is going to cause all kinds of problems in terms of overcounting and duplications and so forth. That is one of the reasons we have sounded the theme about research on "deduplication" throughout this whole thing. But that is different from telephone follow-up, either for reminders to people to send back the question-

naire by mail, or maybe even sending a second questionnaire and so forth, or taking data over the phone after they have already received the form.

It is important to make the distinction between the use of the telephone in those two different instances, and we have been strongly pushing for a sound evaluation of the telephone follow-up once the thing has already been mailed out. So that is one thing that I would put somewhat a high priority on. It is not something that is terribly complicated or terribly expensive. In fact, it should save money on the tests.

So that is something we would balance in terms of the goals, obviously, the cost reduction, and the coverage improvement. I would hate to see everything reduced in this appropriation environment, everything put on cost reduction and everything on coverage improvement more or less going by the boards.

Now, one of the things that Dr. Scarr mentioned the first time although the second time I think he omitted it, will be I think good for coverage improvement on the missed household part. Not for the intra-household coverage, but you remember half the undercount comes from missing households altogether.

We ticked off a whole set of things that they are doing with the Post Office for improving the finding of addresses and so on, so forth. I think that will help on the missing households. But I would hate to see nothing happen in the 1995 census that speaks to the question of improved intra-household enumeration.

There are two prongs, I guess, that we have been pursuing there. One is on the outreach methods, changing the strategy somewhat, what we in our report called "going local," that is doing things that are more locally focused. That has a lot of ramifications in the actual carrying out of things, which need to be looked at.

The other one is in the part of the questionnaire redesign which is being tested to some extent in a test that will happen this year, at least I hope that the funds are still there for the coverage test which looks at two different forms about the way residents are enumerated within the household. There is some research that has been going on which suggests that changing the way the questions are asked in terms of enumerating the people in the household really will improve intra-household coverage quite a lot.

The thing which is hardest to know what to do with in a reduced funding environment is—whatever you do, it has got to be evaluated. And you have got to know whether it is improving or not and by how much.

And in the decennial census, you have two methods. We have traditionally had two methods to do that. One is the demographic analysis, and the other is PES.

Mr. SAWYER. You really are afraid I am not going to ask about this, aren't you? Go right ahead.

Mr. BRADBURN. And in the tests you can't really do demographic analysis, because it will be small areas. So there has got to be something. And we think that—we are just very concerned that if the PES or some version of the PES isn't done, there is not going to be a way of evaluating the results. Because in terms of the things that need to be worked out in detail is the CensusPlus or Super-

Census, although I think SuperCensus is what will emerge as an alternative way.

Mr. SAWYER. Let me turn and ask Dr. Scarr about that, because clearly this is the second time Dr. Bradburn has mentioned it, both in his testimony and in his answer here. But we do know a great deal about the PES.

Mr. SCARR. That is correct.

Mr. SAWYER. We have some sense of what it can do. An awful lot of the research that you have—research and tests that you have proposed have been aimed at CensusPlus and SuperCensus. Given how much we know, is there a conscious conclusion that we know as much as we need to know about PES, that it is not useful in the testing program, or that there is not that much to be gained from continued concentration on refining and developing PES techniques?

Mr. SCARR. We haven't really abandoned it, Mr. Chairman. As you say, we know, you know—we know a good deal about it. But in the 1995 test environment, what we really want to do is learn about other methods that are potentially available to carry out the sorts of corrections in estimation processes that we want to build into the 2000 census.

I think that the priority or the basic paths that I was laying out, and part of the reason for our choice, is that we continue to believe that estimation is the one technique that offers both advantages of enhanced reduction of the differential undercount, and cost savings. So that in a time of frugality, when we are conducting these tests, we really want to know about that and to be absolutely certain that our conclusions with respect to that are firm. Because, as I indicated earlier in the testimony, that in our judgment, in order to deal with the differential undercount, which is our, you know, one of our overarching goals, we have gone about as far as we can with respect to coverage.

Now, the sad part of the 1995 choice that we will have to make is that we won't be able to explore many of the coverage improvements that we had intended to explore. But hopefully we will be able to do something about that; perhaps, you know, in the course of the other tests.

Mr. SAWYER. I didn't mean to suggest that you were abandoning PES, but clearly you have placed your test emphasis on SuperCensus and CensusPlus.

Mr. SCARR. That is correct.

Mr. SAWYER. So that you do have a sense that you know about as much as you are going to know from a test environment about PES, and it is not a case of abandoning it as a potential technique.

Mr. SCARR. And indeed we are carrying on, as Norm knows, continuing discussions with the Academy panel with respect to this set of issues.

Mr. SAWYER. Do either of you have any additional thoughts?

Mr. BRADBURN. I want to make sure that there is no mistaking. We are not—our emphasis here on the PES is not because we think one wants to learn more about the PES, but to have something against which to measure the CensusPlus and SuperCensus.

Mr. SAWYER. A known standard, a known standard against which to measure.

Mr. BRADBURN. If you are going to go out into the unknown, and we are very supportive, we think this is a very good—

Mr. SAWYER. Sure. I don't mean to suggest otherwise.

Mr. BRADBURN. But you need something at this point to do it. Because eventually we at some level don't want the PES because we don't want the two numbers. I mean, we want one number. But at this point, you need something against which to evaluate whatever you come up with and whatever version of SuperCensus or whatever one comes up with.

And the point that we want to keep stressing, I guess, is that as you move forward, you have to ground it in what you already know.

Mr. STEVENS. The PES, it may turn out that that is the best method of census improvements, and that the SuperCensus may not work altogether. So the Bureau needs something as a fall-back possibility. I think one of the problems with the PES is its unfortunate linkage to the adjustment debate of 1990, when it put sort of a psychological onus on it, which is not deserved.

Mr. SAWYER. Somehow I just—I have always believed that the PES' controversy was linked to the forced choice between perceived winners and losers, rather than any kind of deep understanding of the technique itself. And it is really part of what I am talking about when I am talking about the importance that we all need to place on clear and understandable explanations of the importance of statistical techniques, both in improving counts and reducing costs. The techniques are not where the problem is, it seems to me.

Let me ask all of you, Dr. Scarr, you can just sort of separate yourself from this for a moment, all of us, including Members of Congress from many other committees, have expressed enormous hope for interagency cooperation.

And Mr. Stevens and Dr. Bradburn, you both have touched on that and probably no entity, I'm reluctant to say agency, has carried more hopes than the Postal Service. I share that hope.

Do you have any sense of the ability to complete that pilot project in time to be useful in the 1995 test preparations? I have a question that—this is the part I don't want you to pay a whole lot of attention to. I am really concerned about list sharing.

And I can appreciate the problems of confidentiality that every agency needs to face with regard to the work that they do. None more so than the Bureau, and the Bureau needs to be jealous in its guarding of those confidentiality standards. And I can appreciate the Postal Service's concern that they might have some similar kinds of standards, but it seems to me that in having to list share in the direction that the list sharing is going, where the Census Bureau must move its lists over to the Postal Service in order to have them work with instead of moving in the other direction, which in my view would provide the far higher standard of confidentiality, both provokes unnecessary delays, reduces the efficiencies that might be realized, and may in fact quite unintentionally expose the lists to greater potential risk of breach of confidentiality by doing it the way it is being done than in the other direction.

Could you comment on any of that?

Mr. STEVENS. Certainly the Postal Service has reason to have some sensitivity about its lists and what they are used for, because



in recent years, they have had some accusations or allegations of being too free and easy with them. I think it is also important to remember that the Postal Service has undergone a very substantial reorganization. You find new people there in new jobs who are not always familiar with past, and also they are trying to focus on basics.

I think that is one of the reasons for what we perceived as a sort of a reluctance to jump fully and wholeheartedly into the inter-agency cooperation bandwagon. It is also a fact the Postal Service is not—I guess it is part of the executive branch, but it is not directly responsible to the President in the sense that other agencies are, and really about the only institution in which the Postal Service and the Census Bureau interests are brought to bear is perhaps this committee and this subcommittee. There is nobody else—

Mr. SAWYER. This subcommittee in particular.

Mr. STEVENS. Nobody else can bring them together and say here is the way that appears to be in both of your interests. So for all of those reasons, I doubt that there would be very much progress in terms of the Postal Service and the Census Bureau sharing their capabilities if it were not for some external pressure being brought to bear, and probably from here.

Mr. SAWYER. Would you care to comment?

Mr. SCARR. Mr. Chairman, I think that what we need to remember in all this is that the Postal Service and the Bureau have worked together quite effectively, and in fact their relationship is the basis for the conduct of any census I can see in the foreseeable future.

You cannot, even with fundamental change, at least I can't conceive of a census that is not mail out/mail back, at least in the near future. There are those who believe an administrative records census might be possible, but we have trouble with the 1.6 percent undercount and the systems I have seen on those run around 4 percent, so we can imagine what we would get into in the short term.

So I think that we have worked together very closely with the Postal Service. I am also encouraged by the various streams that are going on now. I am encouraged by the work we are doing trying to explore new ways to work together and I am hopeful and believe that the pilot project will be completed in time to play a useful role in the 1995 test design efforts. But what I want to emphasize most is that I think the relationship is very good and very forthcoming.

With respect to the list issue, we are exploring within the Bureau at this point the possibility of perhaps some changes or some new arrangements with respect to sharing addresses and so on and so forth. So I think there is movement in a good direction in that area and we are very pleased with our work with the Postal Service.

Mr. SAWYER. That is encouraging. I just would observe that I am grateful for the Postal Service's concern about confidentiality. I have enormous confidence in the Bureau's record with regard to confidentiality. I know that if there are improvements that come through an upstream flow of information to you, that it is—there is absolutely no chance of its compromise.

And I am not suggesting that a downstream flow to the Postal Service would in any way result in a compromise, but I also know that you don't sell your lists publicly, whereas in fact the Postal Service quite within its mission undertakes that sort of thing. And I would not want to see, on that basis alone, any of this, any of the work that is going on right now compromised.

Mr. SCARR. I think we both—both agencies share that concern, Mr. Chairman.

Mr. SAWYER. Maybe the question that continues to come back on a continuous basis from more sources than any others, and the one that I hear from more Members of Congress at this point, is the concern that somehow new techniques will diminish the precision of a wide variety of the data that is traditionally been gathered.

Mr. Petri was talking to me about that. I hear from other Members of Congress all the time. And I hear from trade publications, letter writers, interest groups of every kind, legitimate concern about small area data.

Could you comment with regard to the techniques that you are proposing, the shifting of data collection timing, and the kind of work that we need to do to reassure the largest body of stakeholders and the broad population of data users that what we are doing will in the end result in a better Federal statistical system that is more usable by a wider range of people?

I suspect you all have something that you might say.

Mr. SCARR. I think we need to separate that into two pieces, Mr. Chairman. One is the interest in making the basic census enumeration, a count and an estimation process put together. I think it is clear that when you do that, you have some degree of increased uncertainty as you get closer to block level.

And you know that uncertainty, so that is the gain. That is one thing. But let's set that aside. With respect to, I think, sampling from the traditional long form, or sampling in a continuous measurement context, the models we are looking at take as their standard an attempt to satisfy the precision needs of different agencies for different pieces of information. And so we are looking at that right now.

Small area is a very slippery word. That is to say, that is why I tried to separate the two. Because by definition, if you introduce sampling and estimation into the basic enumeration, you have at least—you have known uncertainty at the block level which you didn't have before in a straight enumeration, I think—I hope that that is manageable. But that is one of the things we are looking at with respect to our exploration of continuous measurement models.

We are talking to users. I would be less than candid if I said I thought we could satisfy 100 percent of all users with any model we develop. But I think that given the kind of trade-off that you have mentioned in the past and that we have considered between a sort of timeliness and perhaps a slightly decreased level of precision, I am hopeful that we can work out some collection models that are satisfactory.

Mr. SAWYER. Thank you. Move right down the table.

Mr. STEVENS. I am the nonspecialist in this area. So I would certainly agree that there is a point at which data becomes better and a point at which it becomes worse, as you get closer to the block

level. I think what the Bureau really needs to do about this is to be as forthcoming and educational as it possibly can in its efforts to explain exactly what those differences are and to compare them to what we had in 1990.

Some of the cause for concern is just ignorance. The actual effects of these details are not known and an individual association is not able to say precisely what it will have and won't have, won't be able to compare the deficiencies of the 2000 process with the deficiencies of the 1990 process, because certainly neither were perfect, and there is no real cost data.

Some people, I am sure, would like to have everything, but if they realize that the costs of this are tens of millions in a calculation, and something else that they also want might be less, there could be an opportunity to participate in that kind of a trade-off calculation and help the Bureau with that.

Mr. SAWYER. I was thinking in your case, less of the external data users than the agency data users, some of whom, frankly, come before the Congress and all of its various jurisdictions and presume the availability of data that has traditionally existed or in some cases may not exist in the fullest form they anticipate and produce a mounting burden on the Census Bureau, and which is part of the real cost dilemmas that we face at this point.

It seems to me that the congressional, legislative, and the inter-agency educational job is in some ways every bit as important as the broader educational work we need to do among private sector data users and scholars.

Mr. STEVENS. And the Office of Management and Budget appropriately has a major role in that.

Mr. SAWYER. Sure. Dr. Bradburn.

Mr. BRADBURN. Just to reiterate a couple of those points. Clearly, cost is one factor and you can't have it both ways. That is, if you are going to achieve some substantial cost reductions, you have to give up some notion of precision. But the other—there are two other issues about the precision issue, which I think need to be stressed with users.

One of course is one that many people have trouble separating out, the difference between precision and bias. And you can be precisely wrong—

Mr. SAWYER. That is a term that I have used so often. I am glad to hear someone else use it.

Mr. BRADBURN. So I think we of course and I think the people who have been pushing sampling and estimation have said, well, we are certainly willing to trade off some precision to save a lot of money and to be more nearly right in the bias reduction sense.

The other issue—and I think that is particularly an issue with external users, you might say with intra-government users—I think one of the things again that isn't appreciated is precision at what time period, over what time period. Because in some sense, what one buys at present with this enormous cost is a certain precision at one point in time, but it is a very, very rapidly eroding precision for many of the uses that Government agencies want to make of it, very rapid erosions of both accuracy and precision as the decade goes along.

The enormous appeal to me of continuous measurement is to reduce the—is to integrate the precision across the decade and spread out both the uncertainties and reduce the bias.

Mr. SAWYER. And what you may lose in fine grain precision, you may gain in the accuracy of recording change.

Mr. BRADBURN. That is right, yes. And that is, I think, hard for a lot of people to understand exactly what they would be getting or the benefits that they would be getting from that. Speaking for myself, in terms of the kind of educational effort that needs to go on, it is really worth trying to educate users about the enormous advantages they will get from having a continuous measurement in terms of more up-to-date kind of information.

Mr. SAWYER. I noticed in the report that you cited chapter 1 funding as an example of that. It is something we are struggling with on the Education and Labor Committee with the reenactment of the Elementary and Secondary Education Act. It is one of those distortions over time that people can really appreciate and recognize that the dollars we are spending right now in our public schools were grounded in data reflecting 1979 experience. It is shocking.

Mr. BRADBURN. I guess if every place changed at the same rate, it wouldn't be so much a problem.

Mr. SAWYER. Exactly.

Mr. BRADBURN. But the problem is in the small areas that people are interested in, when you talk about this, the rate of change is quite variable. And that is what you need to be picking up with continuous measurement—to be able to adjust for those. If it was a sort of solid decay, so to speak, over the whole period, you could adjust everybody and so forth and so on. But the world doesn't change like that.

Mr. SAWYER. Is there anything further that any of you would like to add this afternoon before we break up?

Mr. BRADBURN. Could I just add one thing?

Of course one does—in the budget situation, one does have to make some very difficult choices, and I would just put in one more plea for not letting the short-term concerns totally erode some of the longer term issues. We have urged particularly on the administrative records side, the establishment of at least some small unit that thinks longer term and isn't under the pressure of doing things for the 1995 test and 2000 and so forth.

And I just worry again that some of the things which everybody says yes would be very good and so forth, but somehow or other because they are not time bound in the same sense that some of these others are, that they will be the thing that gets cut out. And so I hope that even in very tight budgets, some—something will be reserved for the long-term agenda. Otherwise, 10 years from now, my successor and your successors will be sitting here and saying, now, what are we going to do about administrative records development for 2020 instead of 2010.

Mr. SAWYER. We are struggling over a \$10-15 million difference this next couple of weeks, that can well define the difference in quality over which we drive a half a trillion dollar over the next decade in Federal dollars and perhaps a like amount in State dol-

lars that are equally dependent on that data. Doesn't seem like a good trade-off to me.

Mr. SCARR. I guess I would just like to say that this is a fairly ambitious program, when you step back from it and look at it. I would hate to have expectations raised too high in our current budget climate, but I am confident that the Bureau will be able to move forward and make fundamental changes. Many have already come about. I mean, the user-friendly questionnaire, I think, is really a significant change in terms of the attitudes of the Bureau toward respondents.

And I guess once more, Mr. Chairman, I would like to express my appreciation to your subcommittee and your leadership and subcommittee staff and members on basically keeping the issue alive, having people pay attention to it, and basically, you know, being supportive of our efforts. And we do appreciate that.

Mr. SAWYER. Thank you. Thank you all very much. Good hearing; I appreciate it.

This hearing is adjourned.

[Whereupon, at 2:44 p.m., the subcommittee was adjourned.]







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